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Plant Sure Environmentally Safe Ornamental Plant Scheme: Review of existing certification or accreditation schemes and recommendations for a model scheme

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Abstract

The Plant Sure project aims to develop a voluntary accreditation or certification scheme to engage relevant industries in promoting environmentally-safe plants and removing or avoiding the use of plants that pose an unacceptably high environmental weed risk. The Scheme is intended to encourage stakeholders and consumers to select, grow and use environmentally-safe ornamental plants. It will include education and training components to elicit long-term attitudinal and behavioural change in ornamental plant specifiers, suppliers and consumers, while seeking to increase knowledge and awareness of environmental weed issues.

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Plant Sure Environmentally Safe Ornamental Plant Scheme:

Review of existing certification or accreditation schemes and recommendations for a model scheme

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INTRODUCTION

The Plant Sure project aims to develop a voluntary accreditation or certification scheme to engage relevant industries in promoting environmentally-safe plants and removing or avoiding the use of plants that pose an unacceptably high environmental weed risk. The Scheme is intended to encourage stakeholders and consumers to select, grow and use environmentally-safe ornamental plants. It will include education and training components to elicit long-term attitudinal and behavioural change in ornamental plant specifiers, suppliers and consumers, while seeking to increase knowledge and awareness of environmental weed issues.

> The Plant Sure project aims to develop a 'national-ready' and 'sector ready' voluntary accreditation or certification scheme (herein referred to as the 'Scheme') to engage relevant industries in promoting environmentally-safe plants and removing or avoiding the use of plants that pose an unacceptably high environmental weed risk. The Scheme will also encourage the green life industry; stakeholders and consumers to select grow and use environmentally-safe ornamental plants. It will include education and training components to elicit long-term attitudinal and behavioural change in ornamental plant specifiers, suppliers and consumers, while seeking to increase knowledge and awareness of environmental weed issues.

The University of Wollongong team was engaged by the consortium to: (1) investigate, review and assess existing accreditation/certification programs and standards across targeted industry sectors to determine best practice, and identify successful model schemes for use in the Plant Sure project; and 2) recommend a fit for purpose voluntary Scheme model(s) to be refined by all stakeholders in Phase 2 of the Plant Sure project.

This report provides the results of a review of eighteen existing accreditation/certification programs and standards that seek to encourage voluntary involvement in improving particular practices. Our review focussed on Voluntary Environmental Programs that sought to affect individual, group or industry practices in forestry, water management, horticulture, aquaculture, agriculture, pollution and chemical management, although some non-environmental programs were investigated also.

A literature review was conducted which focused on the role of Voluntary Environmental Programs in affecting individual, group or industry practices. The literature review outlined the principles for effective programs, their attributes and the specific practices employed by organisations. We also contexualised the current review by examining the literature on the role of nurseries in plant invasions.

We then reviewed the ten schemes, standards and initiatives provided in the project brief. An additional eight schemes were examined in less detail to identify key defining characteristics that

would assist in designing a scheme. In each case we examined the website for the scheme and where necessary followed this up with direct contact with the organisation. Some schemes have received examination in the scholarly literature, and where relevant this was also included in the analysis. Standout strengths and weaknesses in the context of the proposed nursery industry scheme were highlighted.

Each scheme was scored using the 21 design parameters provided in the project brief as well as a further three criteria that were added by the project team following the literature review. The project required that the various programs be assessed for their useability, transparency, adaptability and suitability for the Plant Sure project. From these scores and the analysis, the schemes were put into one of three categories according to their suitability as a model for the proposed nursery industry scheme:

- Schemes that are suitable as a model for the Plant Sure Scheme;
- Schemes that would not work as a model for the Plant Sure Scheme but which have some features that could be incorporated into the Scheme;
- Schemes that are unsuitable as a model for the Plant Sure Scheme.

Based on the above review, the report provides: 1) a summary of existing schemes or scheme components that could achieve the Plant Sure project objectives; and 2) recommendations for a fit-for-purpose voluntary Scheme model (or models) to be further developed and refined for use in the Plant Sure project by all stakeholders in Phase 2 of the project.

RECOMMENDATIONS

Section 6 of this report discusses these recommendations and associated issues and options in detail. Table 15 provides a list of key decisions that have to be made by the Steering Panel regarding different aspects of the Plant Sure Scheme.

RECOMMENDATION 1: SCOPE OF SCHEME

That within a facilitated workshop, the Plant Sure Scheme steering committee explores the following three options for the scope for the Scheme with a view of deciding which will be most appropriate:

(a) Orientate the Scheme solely at the producers/suppliers of plants;

(b) Orientate the Scheme at all key parts of the supply chain of the Green life industry; or

(c) Commence the Scheme orientated at just at producers and suppliers of plants and then later encompass other parts of the supply chain as well.

RECOMMENDATION 2: INSTITUTIONAL HOME

That the steering committee consider providing an institutional home either in an existing non-government organisation or within an industry association and that these two options be workshopped further by the consortium to determine which is the most viable. If an existing organisation is deemed to be the best option, a third option should be explored whereby the existing organisation is an interim arrangement to get the scheme up and running with the aim of it becoming independent if it is a success.

RECOMMENDATION 3: GOVERNANCE

That the Plant Sure Scheme be governed by a steering committee composed of representatives from nursery and landscape industries, conservation and bush regeneration groups, academia, and government agencies.

RECOMMENDATION 4: EXPERT PANELS

That the Plant Sure Scheme adopts a similar model to PlantRight with one or two technical expert committees to carry out the risk assessment of particular species using an appropriately designed decision-making tool and to generate four regionally specific lists, based on the risk they pose for the environment: species considered invasive (or high risk), alternative plant list; species that should be treated with caution (that is, species of medium risk); and those species which have been successfully eliminated from sale. The list of high risk plants should be as short as practicable and not include species that are already regulated. In addition the technical expert committee(s) should generate (or oversee the production of) a set of standards or charter for the certified scheme members to follow with regards to the sale and use of potentially invasive (high risk) species.

RECOMMENDATION 5: FUNDING

(a) That the Plant Sure Scheme undertakes the development of a business plan as part of Phase 2 of the scheme, to ensure that it is viable into the long term. The business plan should identify opportunities for seed funding and collaboration with similar programs and projects to share knowledge and resources, identify synergies and opportunities and avoid duplication;

(b) That market research is conducted to determine the most appropriate fee structure, based on the likely number of green life organisations that would participate and the amount differently sized nurseries would be prepared to pay;

(c) That industry and other relevant stakeholders be involved in discussions about fee setting;

(d) That applicants pay an initial joining fee scaled depending on how big the organisation is (e.g. < 5 employees; 6-20 employees and non-government organisations; companies with more than 20 employees and government organisations);

(e) That participants in the Scheme pay an administration fee every two years of about the same amount as the initial joining fee; and

(f) Other sources of funding outside fees and industry levies be investigated such as charging fees to undertake species risk assessments and charging royalties to label and use particular species as 'champions' (that is safe for the environment).

RECOMMENDATION 6: ASSESSMENT OF APPLICATIONS

That within a facilitated workshop, the Plant Sure Scheme steering committee explores the following four models for assessing potential participants in the scheme and provides an indication of which one stakeholders would prefer:

- MODEL 1: Assessment of applications is done by staff and the applicant is certified as being compliant;
- MODEL 2: Assessment of applications is done by a technical panel of experts and the applicant is certified as being compliant;
- MODEL 3: Assessment of applications is done by a certified third party assessor and the applicant is certified as being compliant;
- MODEL 4: Potential participants self-assess or are not assessed and they receive some form of certification.

RECOMMENDATION 7: BRANDING

That all green life industry organisations that become certified with the Plant Sure Scheme and conform to the scheme are able to display the scheme's brand/logo on their organisational signage, website and other promotional platforms.

RECOMMENDATION 8: PARTICIPATION

That the Plant Sure Scheme undertakes a process of stakeholder mapping as part of the Phase 2 of the Scheme to identify the range of stakeholders that could be involved in the scheme and the desired methods to involve them. Highly desirable methods of participation are: steering committee and technical committee (with a full range of stakeholders), staff and industry stakeholders. Desirable methods are volunteers and sponsors. Other methods to consider are members, allies and supporters. If volunteers are involved in the scheme (for example in monitoring) a source of volunteers would need to be identified.

RECOMMENDATION 9: MONITORING, EVALUATION AND COMPLIANCE

That the Plant Sure Scheme adopts a similar monitoring and evaluating approach of the PlantRight Scheme: that of a survey of firms and entities that have joined the scheme. This survey would have the functions of determining which invasive (high risk) species are being sold in retail markets, determining the effectiveness of the Scheme and identifying any nurseries or certified industry

members that are not complying with the standards of the Scheme. The monitoring could be conducted either by volunteers, staff or accredited consultants, depending on resources.

RECOMMENDATION 10: SCHEME DESIGN

That the Plant Sure Scheme adopts the following components:

1. An educational and outreach program to educate green life industries of the problems associated with the selling of invasive (high risk) species, and the alternative plants that can be used instead.
2. A training program for green life organisations to undertake which enables them to demonstrate they understand the key issues surrounding sale of invasive (high risk) plants.
3. A document that a green life organisation signs that spells out its obligations in signing up as a Plant Sure organisation.
4. Sensitive recognition and acknowledgement of participating green life organisations, e.g. by allowing them to display the Scheme's brand and logo on their promotional platforms.
5. A monitoring and evaluation system that enables Plant Sure to identify non-complying green life organisations and to evaluate the success of the program.
6. A Charter or Standards document that spells out the approach of Plant Sure in removing invasive (high risk) plants from sale and use.
7. A fee structure based on a Business Planning process that ensures that the Scheme is self-supporting and inclusive of relevant businesses regardless of size, type, industry sector or location.
8. A technical panel or panels encompassing independent expertise that identifies the plants that should not be sold, alternative plants, those that should be watched, and those that have been successfully eliminated from sale.

1. Introduction

BACKGROUND TO THE PLANT SURE PROJECT

The Plant Sure project is based on the premise that the horticultural industry is a significant source of invasive weeds. The project aims to develop a voluntary accreditation or certification scheme (herein referred to as the 'Scheme') to engage relevant industries in promoting environmentally-safe plants and removing or avoiding the use of plants that pose an unacceptably high environmental weed risk. The Scheme is intended to encourage stakeholders and consumers to select, grow and use environmentally-safe ornamental plants. It will include education and training components to elicit long-term attitudinal and behavioural change in ornamental plant specifiers, suppliers and consumers, while seeking to increase knowledge and awareness of environmental weed issues. The Scheme would complement (but not duplicate) the various regulatory and advisory roles of Government.

The project was implemented via a consultative process with a range of key stakeholders, with support from the NSW Environmental Trust. Phase 1 of the Plant Sure project (of which this report is one part) was managed by a consortium comprised of the Nursery and Garden Industry NSW and ACT (NGINA), the Australian Institute of Horticulture (AIH), the NSW Office of Environment and Heritage (OEH), and the NSW Department of Primary Industries (DPI); with guidance by stakeholder reference groups.

SCOPE OF THE WORK

The University of Wollongong team was engaged by the consortium to: (1) investigate, review and assess existing accreditation/certification programs and standards across targeted industry sectors to determine best practice, and identify successful model schemes for use in the Plant Sure project; and 2) recommend a fit for purpose voluntary Scheme model(s) to be refined by all stakeholders in Phase 2 of the Plant Sure project.

The consortium required a comprehensive review of existing voluntary accreditation or certification programs and standards for similar style projects such as ones for invasive species, water use, sustainability, etc. These investigations determined what components should be included in the Scheme and what type of Scheme might be most effective (e.g. accreditation or certification) to achieve project objectives. The scope of this investigation was Australian and international in nature and involved both a literature review and consultation with existing Scheme proponents and participants.

OBJECTIVES

The objectives of this report were to investigate and review existing accreditation/certification programs (at a minimum those listed in Appendix 1 of the project brief, plus other relevant schemes

and standards globally) across a range of industry sectors to determine best practice and identify successful models for:

- useability (e.g. is the scheme being used? If so how? Is it easy to use access?);
- transparency (e.g. is the scheme transparent in its intent and operation?);
- adaptability (e.g. is (or could) the scheme (be) adaptable across a range of green industry sectors?);
- suitability to meet the specifications of the Plant Sure project, as specified in the project brief; and
- other review criteria as determined by the authors.

Based on the above review, the report provides: 1) a summary of existing schemes or scheme components that could achieve the Plant Sure project objectives; and 2) recommendations for a fit-for-purpose voluntary Scheme model (or models) to be further developed and refined for use in the Plant Sure project by all stakeholders in Phase 2 of the project.

2. Methods

We initially conducted a literature review which focused on the role of Voluntary Environmental Programs (VEPs) in affecting individual, group or industry practices in forestry, water management, horticulture, aquaculture, agriculture, pollution and chemical management, among others. The review of literature outlined the principles for effective programs, their attributes and the specific practices employed by organisations. While the review did not focus on a specific sector, the themes covered could be applied to a range of industries, including ornamental plant sales. This review encompassed a range of research on VEPs identifying the common factors that benefit and limit their effectiveness. We also contexualised the current review by examining the literature on the role of the nursery industry in plant invasions.

We then reviewed the ten schemes, standards and initiatives provided in the project brief (see Table 1). An additional eight schemes were also examined in less detail to identify key defining characteristics that would assist in designing a scheme. In each case we examined the website for the scheme and where necessary followed this up with direct contact with the organisation. Some schemes have received examination in the scholarly literature, and where relevant this was also included in the analysis. Standout strengths and weaknesses in the context of the proposed industry scheme were highlighted.

Table 1: Schemes, standards and initiatives reviewed.

Organisation	Website
Smart Approved Watermark	https://www.smartwatermark.org/
Forestry Stewardship Certification	https://au.fsc.org/en-au/for-business/fsc-certification
GreenBizCheck	https://www.greenbizcheck.com/
ISO 14001 International Standard	https://www.saiglobal.com/assurance/environmental/ISO14001.htm
EnviroDevelopment	http://www.envirodevelopment.com.au
Heart Foundation Tick of Approval	https://www.heartfoundation.org.au/healthy-eating/heart-foundation-tick
The National Association for Sustainable Agriculture, Australia: Australian Certified Organic	https://www.nasaa.com.au/ https://aco.net.au/
Grow Me Instead;	http://www.growmeinstead.com.au/
NIASA (Nursery Industry Accreditation Scheme Australia);	https://www.ngia.com.au/Category?Action=View&Category_id=125
Plant Right (California	http://www.plantright.org/
Australian Ethical	https://www.australianethical.com.au
Certified B Corporations	http://bcorporation.com.au
Ethical Clothing Australia	http://ethicalclothingaustralia.org.au
Fairtrade	http://fairtrade.com.au
Global Organic Textile Standard	http://www.global-standard.org
OEKO-TEX	https://www.oeko-tex.com/
Australian Forest Standard	http://www.forestrystandard.org.au/
Government Health Star rating	http://healthstarrating.gov.au/

Methods

Each scheme was assessed using the 21 design parameters provided in the project brief as well as a further three criteria that were added by the project team following the literature review (Parameters #22, #23 and #24) — see Table 2. We developed a scoring mechanism consistent with the companion project conducted by Macquarie University in its review of different decision-making tools. Each design parameter was awarded points:

- binary (yes/no) responses were scored to a maximum of 1 point;
- ranked responses (e.g. low, medium, high) were scored to a maximum of 3 points.

Four design parameters were not scored. Parameters #12 and #13 dealt only with high risk plants in the nursery industry and so were not relevant to most schemes. Information about parameters #3 and #17 proved difficult to glean from the different scheme websites. Parameters that were unclear from the website or follow up contact with the scheme were unscored.

Table 2: List of design parameters used to assess the different voluntary programs.

Design Parameters	Assessment type	Maximum weighting
1. Has a brand that is easily identifiable and inspires consumer confidence	Yes/No	1
2. Provides equitable access to relevant businesses, regardless of size, type, industry sector, or location, to participate in the Scheme	Low/Med/High	3
3. Involves stakeholder mapping to demonstrate understanding of the industry sectors		Not scored
4. Is non-exclusive and open to all industry sectors	Yes/No	1
5. Includes a standardised, simple and easy approach to industry and consumer stakeholders	Low/Med/High	3
6. Is transparent, independent, and robust, and uses best-practice and appropriate governance	Low/Med/High	3
7. Appeals to industry stakeholders and is sustainable for them, both environmentally and economically	Low/Med/High	3
8. Is independent and self-sustaining, such that it "takes on a life of its own" and is run 'outside' of industry, but for industry	Low/Med/High	3
9. Enables broad stakeholder engagement and consultation with a view to broad industry uptake, commitment and ownership of the Scheme	Low/Med/High	3
10. Encompasses independent expertise to develop appropriate Standards, audit and compliance processes, and education elements	Yes/No	1
11. Is based on the agreed decision support tool that is dynamic and will allow plants to be reassessed as needed to determine weed risk	Yes/No	1
12. Allows a transitional approach to removing 'high risk' species from trade over a 12-18 month period (or as determined appropriate via consultation)	Not relevant to most schemes	Not scored
13. Utilises an agreed categorisation and prioritisation of 'high risk' plants for removal from trade	Not relevant to most schemes	Not scored
14. Allows for collaboration with similar programs and projects to share knowledge and resources, identify synergies and opportunities and avoid duplication	Low/Med/High	3
15. Contains robust consumer and industry education and awareness methodologies to promote the Scheme and its objectives	Low/Med/High	3
16. Is able to be adapted or expanded to a cross-jurisdictional/National level, and for other industry sectors following completion of this project	Yes/No	1
17. Includes the development of a business plan or management model		Not scored

to ensure ongoing Scheme viability plus future proofing of Scheme ownership and branding		
18. Includes transparent and appropriate audit and compliance processes	Low/Med/High	3
19. Includes options for an 'institutional home' for the Scheme over the long term	Yes/No	1
20. Includes mechanism for conflict resolution for industry, community and government	Low/Med/High	3
21. Ensures focus on positive environmental and economic outcomes, as well as social and behavioural change regarding use of weedy species, and be inclusive of a range of triple bottom line considerations such as: a. economic, including impacts to green-life industries (and impacts on other primary industries); b. environmental, including to non- and threatened biodiversity; and c. societal, including human and animal health, community, cultural, infrastructure, tourism and other considerations	Low/Med/High	3
22. Participation (recruitment and maintenance of membership)	Low/Med/High	3
23. Standards that signal the intent of the organisation and the required practices of participants	Low/Med/High	3
24. Monitoring standards and whether the group is meeting its aims, as well as monitoring its members to ensure freeriding is not occurring	Low/Med/High	3
Total score		**48**

The project required that the various programs be assessed for their useability, transparency, adaptability and suitability for the Plant Sure project. We deemed that useability was covered by Design Parameters # 2, #5 and 7, transparency was covered by Design Parameter # 6 and adaptability was covered by Design Parameter #16.

From these scores and the analysis the schemes were put into one of three categories according to their suitability as a model for the proposed nursery industry scheme:

- Schemes that are suitable as a model for the Plant Sure Scheme;
- Schemes that would not work as a model for the Plant Sure Scheme but which have some features that could be incorporated into the Scheme;
- Schemes that are unsuitable as a model for the Plant Sure Scheme.

Table 14 provides a listing of all the design parameters required checked against this report's recommendations.

3. Literature Review

PLANT INVASIONS AND THE HORTICULTURAL INDUSTRY

The invasion of non-native species has increased greatly as human trade and movement has increased (Wilson, *et al*., 2009). Ornamental horticulture is recognised as the main pathway of plant invasion worldwide (Dehnen-Schmutz, 2011). The number of species introduced as ornamental plants is highly significant in some countries, for example 53% of deliberately introduced plants in the Czech republic were introduced as ornamentals, in Australia 65% of plant species that became established between 1971 and 1995 were introduced as ornamentals, and 50% of alien flora in Germany consists of deliberately introduced plants and half of these were introduced as ornamentals (Dehnen-Schmutz *et al*., 2007). In the United States the majority of woody invasive species were introduced for horticultural purposes and the nursery industry remains an important source of invasive species (Reichard and White, 2001).

According to the Invasive Species Council over 25,000 species have been introduced to Australia for ornamental purposes (that is 94% of all exotic introductions) (Invasive Species Council, 2009). More than 10% of these species have become established in the wild (naturalised). The rate of the naturalisation of plants is 12 species per annum since European settlement, and 15-20 species per annum since 1980. The chief pathway for introduction has been as garden plants, with some 65% of introduced plants having been introduced as garden plants, and 8% as agricultural plants (Invasive Species Council, 2009). According to Dodd *et al*. (2015) the number of naturalised species had grown linearly in Australia during the period 1880-2000. Their study confirmed that ornamental horticulture had contributed some 1783 species (about 65% of naturalised species richness). Their study also found that the rate of increase of species introductions from ornamental horticulture was declining, possibly due to improved border control measures becoming more adept at preventing the legal introduction of potentially 'invasive' species. Whilst the horticultural industry has been identified as the major source of exotic invasions when considered by number of species, on other measures (such as area of landscape invaded), it is the deliberate introduction of pasture species that has more significance (Cook and Dias, 2006; van Klinken *et al*., 2014).

A related issue to the selling of plants that might become invasive is the unintentional transfer of potential weed species that contaminate the sold plant. That is, weed plants that are present in the potting mix of a plant. These might be present as actual plants or as seeds or other vegetative propagules. Similarly, plant diseases can be spread via nursery plants, such as has recently occurred with the introduction of Myrtle Rust via nursery plants. The nursery industry already has a range of programs that focus on these issues (https://www.ngia.com.au/Category?Action=View&Category_id=497). Whilst the introduction of weed species as contaminants of nursery plants is a related issue to the issue of selling potential

invasive weeds, it is out of scope with respect to this report but the way it has been dealt with could inform the design of the Scheme.

The horticulture industry

In its business plan, the Plant Sure consortium provides the following definitions regarding the ornamental horticulture industry, which this report follows:

1. **Green life**: All plants supplied by the nursery, gardening and horticulture sectors in New South Wales, collectively known as the "Green Industry". This includes plants supplied for gardening purposes and planted in gardens and other domestic purposes; plants supplied for landscaping and public amenity purposes, seedlings and tubestock supplied for vegetable and forestry. This includes Australian native plants that are planted in areas where they are not indigenous or endemic. Although often included (and an important part of the Green life industry), we consider the aquarium trade, in particular fresh and saline water aquatic species, whether planted in aquaria (indoor) or outdoor water features, including water gardens and dams, outside the scope of this project.

2. **Green Industry**: The environmental horticulture industry (or green industry) is comprised of a variety of businesses involved in production, distribution and services associated with ornamental plants, landscape and garden supplies and equipment. Segments of the green industry include wholesale nursery, greenhouse and sod growers, landscape architects, contractors and maintenance firms, retail garden centres, home centres and mass merchandisers with lawn and garden departments, and marketing intermediaries such as brokers, horticultural distribution centres, and re-wholesalers. In addition to these commercial sectors, many State and Local Governments have significant urban forestry operations for management of parks, botanic gardens, and right-of ways that are an integral segment of green infrastructure. The Green Industry is linked to urban forestry by providing quality plant material and professional personnel with specialized expertise for growing, maintaining, and managing city trees. It excludes the production of fresh and saline water aquatic species.

3. **Weedy or 'high risk' ornamental plants** (definition applies to this Business Plan only: terminology will be refined and agreed as part of Scheme development): plants that have been assessed as potential environmental weeds via an agreed plant assessment process to be developed as part of this project.

We note that these definitions do not necessarily map onto standard industry and statistical definitions for the noted groups. We have recommended a stakeholder mapping exercise to address this issue, and in order to develop and confirm a shared understanding amongst the steering committee and stakeholders about the target industry sectors for this scheme.

VOLUNTARY ENVIRONMENTAL PROGRAMS

There are different approaches to encouraging nurseries and other components of the green life industry not to sell or use plants that might become invasive weeds from coercive methods to voluntary schemes. On the coercive end of the spectrum there is increased regulation or the banning of sale of particular plants from nurseries. For example, the Invasive Species Council (2009) advocates a 'permitted list' or 'white list' approach whereby all plants are banned from sale or movement except for specified species. In contrast, a 'black list' approach allows the sale and movement of all plants except those on a prohibited (or noxious weeds) list. A third 'list' based approach is one of compiling 'green lists', as advocated by Dehnen-Schmutz, (2011). With this approach, a list of non-native ornamental species that are judged as having a low likelihood of invasion is compiled and promoted.

There is little doubt that the compiling of lists is useful and has been done extensively by government authorities. But what is required is something that engages the green life industry more fully in not selling or using plants that can become invasive. Voluntary Environmental Programs in which organisations volunteer to change their behaviour have been used extensively in many realms of reducing environmental impact, and it is this approach that is the focus of this report. It was out of scope of the project to examine more coercive options such as using regulation.

Voluntary accreditation or certification programs have received significant attention in the scholarly literature. Commonly referred to as Voluntary Environmental Programs (hereafter VEP), this literature review focuses on the role of voluntary schemes in affecting individual, group or industry practices in forestry, water management, horticulture, aquaculture, agriculture, pollution and chemical management, among others. Segerson (2013: 163) defines a VEP as 'a class of policies, programs, and initiatives under which parties voluntarily agree to participate rather than being legally required or forced to do so.' The following review of VEP literature will outline the principles for effective programs, their attributes and the specific practices employed by organisations. While the review does not focus on a specific sector, the themes covered can be applied to a range of industries, including ornamental plant sales. This review encompasses a range of research on VEPs identifying the common factors that benefit and limit their effectiveness. The three principles discussed below (participation, standards and monitoring) are modified from Segerson's (2013) design features for effective VEPs, but have been extensively discussed by a range of authors in the VEP literature (for example Borck and Coglianese, 2009; Potoski and Prakash, 2013).

Principle 1: Participation

VEP effectiveness is dependent on both the level of participation but also the actions of participants (Borck and Coglianese, 2009; Segerson, 2013). Participation involves two components: recruitment and maintenance of membership. VEPs employ a range of techniques to 'persuade' firms to participate. For example, the USA EPA's 33/50 program wrote to target firms inviting them to

participate (Potoski and Prakash, 2013). In another example, Energy Star sought active input from potential members in the development process of the group's standards, therefore creating a stake for them to participate (Potoski and Prakash, 2013). Other clubs have adopted more hard-line approaches such as actively naming and shaming non-participants (Koehler, 2007).

Gaining and maintaining participation requires creating incentives that encourage organisations to join despite the costs of membership (Prakash and Potoski, 2007). The benefits can be economic or environmental. Economically, VEPs need to provide benefits to offset the costs of participation. It is recommended such benefits be excludable (only participants can appropriate them) providing an incentive for firms to participate (Potoski and Prakash, 2013; Segerson, 2013). Excludable benefits can include access to additional markets of consumers that are willing to pay more for 'environmentally friendly' goods (Lyon and Maxwell 2004). Furthermore, members may find it easier or less costly to raise capital from investors who value the environment (Barnea *et al.*, 2004). Finally, Potoski and Prakash (2013) highlight how the branding benefits associated with VEPs allows stakeholders to sort participants from nonparticipants providing the former with greater credibility and stewardship credentials.

Such excludible benefits may provide economic incentives to participate, but may also offer environmental benefits. An organisation that effectively promotes its environmental stewardship credentials and objectives is able to recruit members with similar environmental objectives (Potoski and Prakash, 2013). This can promote members environmental credentials to the public, while simultaneously building the reputation of the VEP through increasing membership and attracting publically known members (Auld *et al.*, 2008). In addition to gaining credibility, members can also access information to improve practices. Such information can take a variety of forms, including technical assistance provided by regulators and information sharing between members (Berliner and Prakash, 2015). Delmas and Keller's (2005) study of the EPA's WaterWise program documented the role free technical assistance in the form of contractors, internal website information and waste reduction publication as well as annual progress reports in encouraging participation. The importance of supplying information is further supported by Burt *et al.* (2007), in which their study on the horticultural industry's attempt to prevent invasive plants identified that individual's perception of the problem and understanding of their role in mitigating the problem were crucial factors influencing their participation. In this context, providing information about the problem and recommending actions can assist in recruiting new members, with the potential to improve the overall performance of the VEP (Evans *et al.*, 2015).

In addition to recruiting members, participation also hinges on the ability of VEPs to maintain its members. This is highly dependent on a VEP's standards and monitoring (discussed below). However, there are some important aspects to consider in establishing a VEP to maintain membership, and in turn encourage new members to join. In particular, VEPs need to avoid credible commitment problems (Potoski and Prakash, 2013). Credible commitment problems refer to VEPs

changing program design without the consent of members. This can include VEPs, after gaining popularity, diluting standards to gain increased participation at the risk of compromising the original environmental objectives (Potoski and Prakash, 2013). Additionally, VEPs may tighten standards after members join, imposing additional requirements either directly or indirectly (Prakash and Potoski, 2012). Therefore, participation is dependant not only on the attractiveness of the VEP both in terms of environmental credibility and excludable benefits, but also maintaining amicable relationships with members. As will be discussed in the principles below, maintaining participation depends on the standards established in the VEP as well as the mechanisms in place to monitor the effectives of the program and its members.

Principle 2: Standards

The second principle, standards, is cited as being crucial in determining a VEPs effectiveness (Potoski and Prakash, 2013; Segerson, 2013). Standards consist of the rules governing entry and the actual content of the regulatory regime (Gugerty, 2009). VEP standards may stipulate the measurable, monitored and easily understood performance indicators (Potoski and Prakash, 2013). In the context of voluntary certification or accreditation programs it is important to establish standards that signal the intent of the organisation and the required practices of participants (Borck and Coglianese, 2009). In particular, standards indicate the amount of beyond-compliance behaviour required by the program, and the environmental benefits of participation (Prakash and Potoski, 2007).

VEP standards impose various requirements, such as: pollution reduction targets; disclosure requirements; adoption of specific management practices or products to address the environmental problem; and banning sales of certain products (Segerson, 2013). The stringency of standards, it is argued, increases the legitimacy of the VEP, and in turn encourages participation due to the program's credible reputation (Kalfagianni and Pattberg, 2013). The stringency of VEP standards are determined by the following characteristics: they include both performance and management indicators (i.e. whether standards are being met by members and the environmental outcomes of the VEP itself) (Auld *et al*., 2008; Gulbrandsen, 2010; Ward, 2008), and if the targets go beyond existing regulation and/or envision greater environmental change relative to other private standards (Kalfagianni and Pattberg, 2013).

VEPs standards can establish performance goals that can help focus the activities of members, enhance internal oversight of environmental improvement, and unify members around a common issue (Potoski and Prakash, 2013). However, as noted with the Forest Stewardship Council (FSC), while standards can provide a framework for procedure they also need to be supplemented with substantive information and adequate reflection on such frameworks in order to remain aware of the social, economic, and environmental impacts of the program (Auld *et al*., 2008; Dare *et al*., 2011). If not, VEPs may proceed with mechanistic standards that become stagnant, with the potential to worsen the environment and/or social relationships (Dare *et al*., 2011). In response, Dare *et al*. (2011)

encourages certification standards to engender a culture of continual improvement alongside persistent reporting and documentation required for auditing purposes.

The stringency of standards, it is argued, increases the legitimacy of the VEP and in turn encourages participation due to the organisation's reputation. Therefore, participating in a VEP may provide members a reputational benefit based on the brands signal (Prakash and Potoski, 2007). However, research suggests that the stringency of standards affects participation. The more stringent a VEP's environmental standards, the more they require members to produce more environmental public goods, which may attract fewer participants as firms may not receive enough rewards to justify the costs (Potoski and Prakash, 2013). There thus remains an important balance for VEPs to find: if standards are too stringent membership will be smaller and potentially have less impact in addressing the environmental issue, however if a VEP reduces the stringency of standards to increase participation it can result in a loss of legitimacy and the brand suffers (Potoski and Prakash, 2013). Therefore, standards and club size are intrinsically connected and it is essential that a VEP group considers its optimal group when drafting the stringency of standards. To date, research is yet to identify this optimal balance with any specificity. Although, Bork and Coglianese (2009) suggest such a balance depends on the industries targeted by the VEP, the type of environmental issue being addressed, the geographical location, and the general economic climate.

Principle 3: Monitoring and Enforcement

The effectiveness of a VEP depends on the stringency of standards, number of participants, and the impact of the program on participant practices (Borck and Coglianese, 2009; Segerson, 2013). In particular, the effectiveness of a VEP is largely contingent on monitoring (Potoski and Prakash, 2013). This includes monitoring the VEP's standards and whether the group is meeting its aims, as well as monitoring its members to ensure issues of shirking or free-riding are not occurring (Segerson, 2013). Monitoring provides a mechanism to maintain a VEPs' credibility through reporting on environmental outcomes and maintaining commitments of its members. Moreover, when standards are effectively monitored and outcomes are reported it provides a level of legitimacy that can improve a group's reputation and in turn incentivise participation.

The first key aspect of monitoring is ensuring the VEP is meeting its targets. Ramesteiner and Simula's (2003) study of FSC firms identified that ongoing auditing and reporting in certification schemes promotes a transparent and reflective decision-making setting, which can improve environmental outcomes and the relationships between members. A VEP that has in place effective monitoring, public disclosure and sanctioning processes increases the likelihood that members will adhere to club standards, and in turn the VEP will meet its environmental objectives (Potoski and Prakash, 2013; Segerson, 2013). A particular challenge for VEPs is to overcome issues of shirking, or free-riding. Some members that join a VEP may not adhere to the required standards, while simultaneously benefitting from the VEP's brand signal (Berliner and Prakash, 2015; Darnall and

Sides, 2008; Potoski and Prakash, 2005). Shirking not only results in lower efficacy in a VEPs performance, but also risks compromising the legitimacy of the program (Potoski and Prakash, 2013).

Extensive research has documented the need for VEPs to employ some mechanism to curb shirking. Berliner and Prakash (2015) demonstrated how for the United Nations Global Compact, a voluntary regulatory program that seeks to improve environmental, human rights, and labor policies of participating firms, the lack of stringent monitoring and enforcement mechanisms led to an increase in strategic shirking as firms did not comply with program obligations. Potoski and Prakash (2005) noted that regulators and managers of ISO 14001 cited external audits as a key mechanism safeguarding against wilful shirking. Potoski and Prakash (2005) recommend VEPs employ 'swords' to ensure members comply with program obligations. The authors identify three types of swords that VEPs wield. Firstly, 'strong swords' consist of audits, disclosure and sanctioning mechanisms. Secondly, 'medium swords' involve third-party audits that are publicly disclosed. Although medium swords do not include sanctions, they still discourage shirking through publicly disclosing performance information (e.g. EPA 33/50 and European Union's Environmental Management and Audit System). Thirdly, 'weak swords' require only third-party audits (for example the ISO14001). Weak swords do not publicly disclose auditing information, and as a result are less effective in curbing shirking. However, the ISO 14001 application of weak swords, in reported cases, has mitigated against free riding issues, leading to better adherence of club standards, and in turn improved compliance with government regulations (Prakash and Potoski, 2007).

Alternatively, shirking can also be curbed through social pressures (Kalfagianni and Pattberg, 2013; Koehler, 2007). This perspective does not emphasise formal monitoring and sanctioning procedures, but instead relies on the power of norms and socialisation (Potoski and Prakash, 2013). King and Lennox (2000) detail the role of coercive, normative and mimetic forces in persuading members to adopt and perform VEP standards. Coercive forces may involve publicising the name of nonconforming members, leading to intense scrutiny and pressure on laggards. The Chemical Manufacturers Association 'Responsible Care Program' cites this mechanism as the most effective means of exerting pressure on firms (King and Lennox, 2000). Normative forces involve the diffusion of values or norms that align with VEPs standards. Returning to Responsible Care, the VEP created and codified new values and norms that penetrated the internal practices of participating firms, and changed their preferences and routines. Mimetic forces extend from existing norms and values through disseminating information on best practices across members in order to improve the behaviours of all members (King and Lennox, 2000). Such forces are argued to curb shirking through increasing social pressures on free-riders, which in turn improves the VEPs overall performance and reputation (Gulbrandsen, 2005).

However, as noted with Responsible Care, when VEPs operate without explicit sanctions for shirking it leads to increases in opportunism, and members will be more likely to free-ride. Indeed, King and Lennox's (2000) study of Responsible Care highlighted the difficulty of creating self-

regulation without explicit sanctions, which led to continued free-riding among members. In response, Prakash and Potoski (2007) recognise the need for norms to be strengthened with effective institutional design (i.e. swords) in order to produce the most effective mechanisms for curbing shirking and improving VEP performance. Additionally, Rametsteiner and Simula (2003) note that when certification schemes create the norms and values that strive for continual improvement *with* ongoing auditing and reporting of forest management practices, it promotes a transparent and reflexive decision-making environment that improve environmental performance and community relations (Dare *et al*. 2011).

Overall, the literature suggests VEPs need to be complemented with or supported by existing regulatory structures in order to be more effective. Segerson (2013) argues that meaningful environmental improvements through VEPs are much less likely when there is a lack of political will for mandatory policies. Additionally, Hulme *et al*.'s (2017) review of the ornamental horticulture supply-chain's ability to prevent plant invasions identified the need for voluntary codes to be supported by evidence-based and independent advice regarding species invasiveness. The authors argue that there is seldom sufficient market incentive or social leverage to adopt such voluntary codes, due to the current inability in assessing the effectiveness of existing programs (Hulme et al., 2017). Taken together, a VEP's effectiveness is significantly improved when partnered or supplemented with government regulations and independent auditors, which increases legitimacy, membership and in turn the effectiveness of the overall program.

Table 3: The principles and practices determining the effectiveness of voluntary environmental programs (VEPs).

Themes	Tools	Examples
Principle 1: Participation		
Recruitment	Writing to target firms Active input in establishing the VEP Naming and shaming non-participants Excludable benefits	- EPA 33/50 (Arora & Cason 1996). - Creating a stake for firms to participate: Energy Star (EPA) (Potoski & Prakash 2013) - Meetings and forums to help leading firms find lagging ones: Catchment Management Authority's (CMA's) Responsible Care (King & Lennox 2000) - Branding benefits: new markets of consumers e.g. suppliers of the EPA's Energy Star products offer lower energy bills with certified appliances (Potoski & Prakash 2013); - Access to information: new members have access to technical information e.g. WaterWise program (Delmas & Keller 2005); - Financial incentives: subsidies or cash incentives for participation e.g. Rural lands Incentive Program (Marynissen & Campbell 2006) and Climate Wise (Samantha & Jonathan 2013)
Maintaining Membership	Avoiding Credible Commitment Problems	- Firms are granted authority in the rule making process: Sustainable Forestry Initiative (SFI) (Auld *et al*. 2008); - Supermajority voting rules on club standards: International Organization for Standardization (ISO) (Potoski & Prakash 2013); - External certification standards: The International Social and Environmental Accreditation and Labeling (ISEAL) Alliance (Auld *et al.* 2008; Potoski & Prakash 2013)
Principle 2: Standards		
2. Rules and content of program	Establishing requirements of participants, and objectives from participation	- Environmental and social 'strength and concern indicators' e.g. Global Compact (Berliner & Prakash, 2015: 123); - Social standards: Social responsibility and accountability e.g. FSC (Auld *et al*. 2008); - Environmental standards: pollution reduction targets (ISO 14001); disclosure requirements of environmental records (FSC); adoption of specific practices (ISO 14001; FSC, MSC), or products to address the environmental problem (ISO 14001) (Potoski & Prakash 2013)
Principle 3: Monitoring and enforcement		
Performance indicators and shirking	Swords (auditing, disclosure and sanctions)	- "Strong swords" consist of audits, disclosure and sanctioning mechanisms (no empirical studies); - "Medium swords" involve third-party audits that are publicly disclosed (EPA's 33/50); - "Weak swords" require only third-party audits (ISO 14001)(Berliner & Prakash 2015; Prakash & Potoski 2007; Potoski & Prakash 2005)
	Social norms	- Coercive forces may involve publicising the name of non-conforming members, leading to intense scrutiny and pressure on laggards; - Normative forces involve the diffusion of values or norms that align with VEPs standards that may change a company's practices; - Mimetic forces extend from existing norms and values through disseminating information on best practices across members in order to improve the behaviours of all members (CMA's Responsible Care; ISO 14001) - (Berliner & Prakash 2012; King & Lenox 2000; Potoski & Prakash 2013)

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4. Overview of existing schemes, standards and initiatives

SMART APPROVED WATERMARK

This scheme certifies water efficient products and services across Europe and Australia to help customers to make an informed choice about saving water.

Scheme description, rationale and logic

Smart WaterMark certifies water efficient products and services across Europe and Australia to help potential customers make an informed choice about saving water. The scheme also provides advice on saving water.

Customers can identify such products with the Smart WaterMark logo to ensure what they are buying saves water. The scheme covers products for gardening, grey water, plumbing, watering, cleaning, car washing, swimming pools, bathrooms, leak detection etc. as well as particular services in water saving.

Product and service providers apply to Smart Approved WaterMark and their application is assessed by an independent Technical Expert Panel, against the following criteria:

- the primary purpose of the product or service is directly related to reducing actual water use and/or using water more efficiently, where there is a direct correlation between the use of the product and water savings;
- the appropriate use of the product or service is consistent with supplied instructions and other documentation;
- the product or service is of high quality and meets industry standards, and customer and community expectations, in relation to water use;
- the product or service, while satisfying the above three criteria, is environmentally sustainable, and despite claimed water savings will not adversely affect the environment in other areas.

The application process starts with the submission of an application form and documentation to support water-saving claims. An application fee, which covers the cost of administering the application process, is due before the application is considered. Fees vary depending on the size of the applicant, ranging from $350 to $1500 (categories ranging from small businesses with less than 5 employees, medium-sized businesses (6-20 employees) and non-government organisations to companies with over 20 employees or government organisations. The application is assessed by the scheme's independent Technical Expert Panel which meets three times a year to assess applications. The outcome of application assessments is conveyed to the applicant approximately 1-2 weeks after

each Expert Panel meeting. Water saving claims by the applicant need to be independently verified (such as independent testing, case studies or comparative reports). Unsubstantiated marketing claims are not regarded as evidence of water saving. In Europe, Smart WaterMark does not certify any bathroom products covered by the European Water Label. Likewise, in Australia, the Smart WaterMark is the outdoor sister scheme to the Water Efficiency Labelling and Standards scheme (WELS). Products registered under WELS are not considered for the Smart Approved WaterMark label.

Once the application is approved, applicants pay a 2-year licence fee of the similar amount as the application fee and can use the Smart WaterMark logo to promote their product or service in Europe or Australia. The logo can be used on the applicant's website, all marketing materials, on product packaging, at events and displays and in advertising.

After two years the applicant can apply to have the product approval renewed. At this stage the product is checked by the technical panel to ensure that it is still in line with any new technologies or products on the market. The panel can go back to the applicant and request new tests or further information and may not necessarily approve the product again.

The organisation is self-sufficient from the money it receives it gains from the application fees, licence fees. Smart WaterMark also provides advice to members (such as water use utilities and councils) and this is another source of income.

Organisation structure

Smart WaterMark is a non-government organisation with a Board, small staff, and a Technical Expert Panel of eight industry experts from backgrounds in the nursery/horticultural, irrigation/landscape, plumbing, education and water industries.

Through the Smart Water Advice brand, the organisation works with water utilities and councils to deliver a range of educational, interactive water saving resources and campaigns designed to encourage behaviour change around water efficiency. It also conducts research to inform delivery of successful water efficiency programs.

Stakeholders involved with the scheme

The scheme has a broad range of stakeholders, including:

- founding partners such as the Water Services Association of Australia, the Australian Water Association and the Nursery and Garden Industry Australia;
- various supporters such as Tweed Shire Council, Unity Water, City of Gold Coast, Victoria State Government (Environment, Land and Planning);
- the licencees (those organisations that have been approved to use the logo);
- local councils and water supply utilities; and
- government.

Strengths and weaknesses/analysis

Strengths

- Fee accompanying application and licence provides financial independence
- Technical Expert Panel that assesses applications
- Mechanism to discontinue endorsement of a product
- Educational program
- Independent non-government organisation

Weaknesses

- Accreditation is mainly for particular products, rather than behaviour of an industry organisation

References

Smart Approved Watermark website: https://www.smartwatermark.org/
Interview with Chris Philpot, CEO 26 October 2017

FORESTRY STEWARDSHIP CERTIFICATION

The Forestry Stewardship Certification scheme identifies forest products that have come from responsibly managed forests.

Scheme description, rationale and logic

The Forestry Stewardship Certification (FSC) trademarks aim to provide a guarantee to consumers that the products they buy come from responsible sources; that is that they support forest conservation, offer social benefits, and enable the market to provide an incentive for better forest management. Only certified products may carry the FSC on-product label. The FSC logo is also available for non-product related promotional, educational and press use under certain circumstances. FSC certification can be sought by forest managers, product manufacturers and retailers.

Forest management certification involves an inspection of the forest management unit by an independent FSC-accredited certification body to check that the forest complies with the internationally-agreed 'FSC 10 Principles of Responsible Forest Management' (https://ic.fsc.org/en/what-is-fsc-certification/principles-criteria/fscs-10-principles). These principles are spelt out in greater detail in the document 'International Generic Indicators' (http://igi.fsc.org/approved-documents.60.htm) and the 'FSC International Standard' (https://ic.fsc.org/en/document-center/id/59). If the forest complies with FSC standards, then the FSC accredited certification body issues a certificate for the operation. The principles cover compliance with national and international laws, conventions and agreements, workers rights and employment conditions, Indigenous peoples' rights, community relations, benefits from the forest, environmental values and impacts, management planning, monitoring and assessment, conservation values, and triple bottom line objectives.

Being FSC certified means that the forest, or supply chain, is managed responsibly; that forest managers comply with stipulated environmental, social, and economic standards. This covers much more than the trees themselves – among other things, it makes sure that local communities are respected, protects the habitats of endangered plant and animal species, and ensures workers are properly paid. When a company becomes certified, its products can carry a FSC label.

FSC is not the only forest management system, but it asserts that its certification is credible and trusted and that increasing numbers of organisations and governments specify that FSC-certified materials must be used in procurement processes, including organisations such as the World Wide Fund for Nature. FSC asserts that FSC certification is the most widely adopted framework among Fortune 500 companies.

FSC forest management certification is awarded for responsible management of a forest or plantation area. Wood, and other tree-based products, sourced from forests can undergo many processes before they become a product, so FSC chain of custody certification tracks FSC-certified

material from forest to store. Trademark licensing is an alternative to certification which is available for retailers, media organisations, or educational institution that might not want or need to become certified, but may still want to promote FSC-labelled products or FSC certification as a framework.

Individual certification bodies that carry out assessments on behalf of FSC each determine their own fees. There are currently nine such bodies in Australia. There is also an annual administration fee that an applicant pays through their certification body as part of their annual FSC certification audit. The fee was established to support the core FSC functions and services provided to certificate holders. The fee paid is dependent on the type of certification held, the size, and type, of the forest area or site, and the applicant's annual turnover.

Forest Management certification (FM) shows that forest managers or owners are managing their forests in a responsible way and meet FSC standards. Chain of Custody (CoC) certification provides a guarantee about the production and source of FSC-certified products. It is for businesses manufacturing or trading forest products. Chain of Custody certification verifies that products are handled correctly at every stage of production – from forest to shelf. According to the FSC website some 200 million hectares of forest in 84 countries have FSC forest management certification and 1,500 certificates have been issued. Some 33,000 certificates have been issued in 120 countries for Chain of Custody certification.

There is documentation of serious breaches of FSC scheme, for example illegal land clearing and forest clearance by a Vietnamese timber company in Cambodia. Responding to a complaint submitted by Global Witness last November, the FSC found that the state-owned company had illegally destroyed at least 50,000 hectares of forest for its rubber plantations in Cambodia, including wildlife sanctuaries and protected areas. This case it was investigated by the FSC and certification of the company was withdrawn (https://www.globalwitness.org/en/press-releases/vietnam-rubber-group-stripped-forest-stewardship-council-certification-forest-destruction-illegal-land-grabs-and-human-rights-abuses/).

Organisation structure

The FSC is a large international non-profit membership based organisation (https://ic.fsc.org/en/what-is-fsc/the-fsc-team). Members meet annually and elect a Board of Directors, including people from environmental groups, community groups and forest product companies. It asserts that it is supported by World Wildlife Fund, Greenpeace and The Australian Conservation Foundation, and by major forest product retailers. There are two categories of membership: institutional and individual. Members select to belong to one of three chapters (environmental, social or economic) and are further categorised into northern or southern sub-chapters (depending on what part of the world they come from). Decision-making is by consensus among the different chapters (https://ic.fsc.org/en/what-is-fsc/governance).

Stakeholders involved with the scheme

Stakeholders and organisations involved with the scheme as members is diverse and includes environmental groups, social interest groups, indigenous peoples' organisations, responsible retailers and lead forest management companies (see FSC website: https://au.fsc.org/en-au/about-fsc/fsc-australia/fsc-australia-governance/fsc-australia-members).

Strengths and weaknesses/analysis

The Forest Stewardship Scheme (FSC), dating from 1993, is one of the first and most influential global voluntary certification and labelling schemes (Auld, Gulbrandsen *et al*., 2008). There are many such schemes, many of them producer-backed schemes formed in response to the FSC itself, which was initiated largely by NGOs after failures to secure support for such a scheme and for a global forests convention through intergovernmental processes (Auld, Gulbrandsen *et al*., 2008, Bell and Hindmoor, 2012). Most other schemes are affiliated with the producer-associated Programme for the Endorsement of Forest Certification (PEFC), which as a global scheme dates from 2003. There is a voluminous research and grey literature on such schemes and their role and impact on forest management, conservation, communities, employment, and environmental governance more generally. This reflects the complexity, scale, and contested nature of forest and timber management, industries, and trade.

Despite this level of investigation, knowledge of on-the ground socio-economic and ecological impact is lacking, in part because of the difficulty of isolating schemes such as the FSC from other factors influencing land use, employment, and conservation outcomes (Auld, Gulbrandsen *et al*., 2008, Clark and Kozar, 2011, WWF, 2014). A 2008 review by Auld, Gulbrandsen *et al*., (2008) appears to remain unrepeated. Nonetheless, some aspects of the operations of the FSC and other schemes are better understood. Producer uptake is the most common proxy measurement of the impact of these schemes and the uptake of forestry certification schemes has been significant. In their 2008 review, Auld, Gulbrandsen *et al*., (2008), state that for 2007, 23% of the world's production forests were covered by either FSC or PEFC-affiliated certification. Sweden had 40% of its forests under FSC certification, Canada 6.5%, four countries with small forest areas nonetheless had over half their forest area FSC certified, and 16 countries had from 10-49% of their forests FSC certified. By late 2007, the FSC had issued 7219 chain-of-custody certificates in 84 countries, and 24% of annual global industrial roundwood production had been either FSC or PEFC certified. In Australia, by 2010, FSC had certified 547,000 hectares of forest and issued 203 chain of custody certificates (Bell and Hindmoor, 2012). Other assessments of the reach of FSC certification similarly show significant level of reach but note that such metrics can be obscure difficulties in measurement and can be simplistic (Forrer and Mo, 2013).

Producer adoption patterns for the FSC have been shown to vary around the size of operation (e.g. compliance costs are high for smaller operations), product characteristics (e.g. producers of higher value timber gain more from FSC certification), whether strong industry associations exist who can develop their own competing schemes, whether NGOs supported the scheme and promoted it, and whether governments have supported the scheme (Auld, Gulbrandsen *et al*., 2008, Bell and Hindmoor, 2012). Such government support can be in the form of direct financial support, or in forms such as supportive procurement policies, certification for their own forestry operations, and where existing regulations mean that certification is more straightforward or where new regulations encourage or require certification.

Whether the types of markets producers are selling into has a less certain influence on adoption. In some cases, FSC certification has become more important simply to gain market access and also for enhancing competitiveness for domestic producers facing competition from imported timber (Auld, Gulbrandsen *et al*., 2008).

In terms of actual motivations for adoption, 'signalling', that is making clear a firm's commitment to responsible forestry and timber practices by adopting FSC certification, is an important reason. Signalling is not necessarily about gaining higher prices per se but is about corporate credibility and image and how this can help generate new business relationships and opportunities (Galati, Gianguzzi *et a*l., 2017).

Over time, the FSC has responded to some of these issues where possible. For example, efforts to reduce the costs faced by smaller producers have included FSC's Small and Low Intensity Managed Forests program where technical requirements are 'streamlined' (Klooster, 2005) and group certification can address some of the costs of certification (Scrase, 1999).

In terms of mechanisms, auditing has led to success in changing the practices of FSC certified companies. The FSC reviews selected audits and can revoke certification; they also require audits results to be disclosed publicly (Auld, Gulbrandsen *et al*., 2008). Audits are carried out by third party (independent) certification bodies, a process that has developed as the FSC has responded to disquiet over its processes (Malets, 2017). If someone complains they have a separate process on how the complaint is dealt with. More generally, the FSC has been assessed as being a highly 'recursive' organisation that engages in cycles of stakeholder-driven review and revision (Malets, 2017).

In Australia, there are two forestry schemes, the FSC and the industry-affiliated Australian Forestry Standard (AFS; affiliated with the PEFC). The FSC uses a performance-based approach to standard setting (Gale, 2014). Such an approach 'establishes the parameters of the output of a production process' and principles and criteria are stated as 'outputs to be achieved rather than inputs to be implemented' (Gale, 2014: p.402). In contrast, the AFS, while otherwise institutionally similar, uses a management standards approach to minimise environmental risks (Gale, 2014). Consistent with this, earlier reviews of the FSC and producer-backed schemes show that FSC standards tend to be

relatively prescriptive compared to the producer schemes which tend to be more flexible (Auld, Gulbrandsen *et al*., 2008).

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GREENBIZCHECK

Encourages businesses to introduce environmental management systems that reduce their consumption of energy, greenhouse gas emissions and water, and reduce their waste and transportation requirements.

Scheme description, rationale and logic

The scheme certifies businesses for their environmental management. It provides an online assessment that covers energy, water, waste, recycling, transportation, procurement, supply chain and an optional greenhouse gas calculator. This then gives the business a scorecard and an easy to use, effective action plan to reach a 60% score for Bronze, a 70% score for Silver or an 80% score for Gold certification. It provides for an online desktop audit by Bureau Veritas, an internationally recognised organisation that tests, inspects and certifies different services in safety, environmental protection and social responsibility (http://www.bureauveritas.com/home/about-us/profile-logo/). The business provides documentary evidence and Bureau Veritas verifies it and issues a Corporate Social Responsibility (CSR) certificate.

Organisation structure

It is unclear what kind of organisation Greenbiz is from the website and its institutional home.

Volunteers involved

There is no involvement of volunteers evident.

Stakeholders involved with the scheme

It is unclear what stakeholders are involved in Greenbiz from the website.

Strengths and weaknesses/analysis

The website for Greenbiz provides very little information about the organisation and how it is organised. A person has to register as a client and presumably proceed through the certification process before they can learn more.

References

GreenBizCheck: https://www.greenbizcheck.com/

ISO 14001 INTERNATIONAL STANDARD

Enables organisations of any type or size to develop and implement a policy that is committed to environmental responsibility, such as resource sustainability, prevention of pollution, climate change mitigation and minimisation of environmental impact.

Scheme description, rationale and logic

The ISO 14001 Management System is an international standard that specifies the requirements for a structured voluntary (non-regulated) management approach to environmental protection. Its purpose is to enable an organisation of any type or size to develop and implement a policy that is committed to environmental responsibility; such as resource sustainability, prevention of pollution, climate change mitigation and minimisation of environmental impact. An Environmental Management System (EMS) is a framework, which can be integrated with existing business processes to effectively identify, measure, manage and control environmental impacts and hence environmental risks and has been adopted worldwide by some 36,000 organisations. The International Standard ISO 14001:2015 lists the requirements that most organisations set out to achieve (https://www.iso.org/obp/ui/#iso:std:iso:14001:ed-3:v1:en). The standards are developed by the ISO Standards Committee and reviewed periodically.

According to the ISO organisation, the benefits to a company going through the ISO 14001 process is that it can demonstrate that it has an improved corporate citizenship and social responsibility within an environmental context, and that it complies with regulatory requirements and has proactive risk management from environmental impact. This can result in long-term business strategies by safeguarding resource management and competitive advantage and broadened market scope for contracts and tenders (especially government). In an analysis of 264 manufacturing companies in the USA (23% of USA companies that had adopted the ISO 14001 standard) it was found that 75% reduced their greenhouse gas emissions during the period 1996-2001 (Szmanski & Tiwari, 2004).

The level of detail and complexity of the environmental management system will vary depending on the context of the organisation, the scope of its environmental management system, its compliance obligations, and the nature of its activities, products and services, including its environmental aspects and associated environmental impacts. The basis for the approach underlying an environmental management system is founded on the concept of Plan-Do-Check-Act. This model provides an iterative process used by organisations to achieve continual improvement. It can be applied to an environmental management system and to each of its individual elements. It can be briefly described as follows:

- Plan: establish environmental objectives and processes necessary to deliver results in accordance with the organisation's environmental policy (the organisation sets its own targets and performance measures);
- Do: implement the processes as planned;
- Check: monitor and measure processes against the environmental policy, including its commitments, environmental objectives and operating criteria, and report the results;
- Act: take actions to continually improve.

An organisation can select from four options regarding how they want to be monitored:

- make a self-determination and self-declaration, or
- seek confirmation of its conformance by parties having an interest in the organisation, such as customers, or
- seek confirmation of its self-declaration by a party external to the organisation, or
- seek certification/registration of its environmental management system by an external organisation.

Organisation structure

ISO is an independent, non-governmental organisation made up of members from the national standards bodies of 162 countries. Its members meet once a year for a General Assembly that decides its strategic objectives. The Central Secretariat in Geneva, Switzerland, coordinates the system and runs day-to-day operations, and is overseen by the Secretary General. The ISO Council takes care of most governance issues. It meets twice a year and is made up of 20 member bodies, the ISO Officers and the Chairs of the Policy Development Committees. Under the Council there are a number of bodies that provide guidance and management on specific issues. The management of the technical work is taken care of by the Technical Management Board. This body is also responsible for the technical committees that lead standard development and any strategic advisory boards created on technical matters.

Members of the ISO organisation are the foremost standards organisations in their countries and there is only one member per country. Each member represents ISO in its country. Individuals or companies cannot become ISO members. There are three member categories. Each enjoys a different level of access and influence over the ISO system. Full members (or member bodies) influence ISO standards development and strategy by participating and voting in ISO technical and policy meetings. Full members sell and adopt ISO International Standards nationally. Correspondent members observe the development of ISO standards and strategy by attending ISO technical and policy meetings as observers. Correspondent members can sell and adopt ISO International Standards nationally. Subscriber members keep up to date on ISO's work but cannot participate in it. They do not sell or adopt ISO International Standards nationally.

Stakeholders involved with the scheme

The ISO works closely with two other international standards development organisations, the International Electrotechnical Commission and International Telecommunication Union with whom it formed the World Standards Cooperation to strengthen the standards systems of the three organisations. The ISO has a close relationship with the World Trade Organisation and works with United Nations partners. In total, ISO collaborates with over 700 international, regional and national organisations. These organisations take part in the standard development process as well as sharing expertise and best practices.

Strengths and weaknesses/analysis

Aspects that are useful for Plant Sure:

- Voluntary. An organisation uses the standard to plan and implement a program of environmental management.
- Clear guidelines/standards for organisations to follow

Disadvantages for the Plant Sure scheme:

- Too complex. Nurseries are unlikely to go through a really detailed standard.

References

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ENVIRODEVELOPMENT

A branding system designed to make it easier for purchasers to recognise and, thereby, select more environmentally sustainable homes and lifestyles.

Scheme description, rationale and logic

EnviroDevelopment is a branding system designed to make it easier for purchasers to recognise and, thereby, select more environmentally sustainable homes and lifestyles. Developers are able to brand their development according to its sustainability in energy and water consumption, use of materials, waste management, impact on biodiversity and community consultation.

Developers apply to EnviroDevelopment to certify their development. The project is registered and a registration fee is paid following consultation with EnviroDevelopment staff. They then have to follow the 200 page EnviroDevelopment National Standards document in designing their development (http://www.envirodevelopment.com.au/_dbase_upl/National_Technical_Standards_V2.pdf). This document sets out in great detail the specifications a development needs to meet, with regards energy and water consumption, use of materials, waste management, impact on biodiversity and community consultation. Certified developments have to demonstrate that they have been designed to protect the environment and use resources responsibly, whilst offering a range of benefits to homeowners, industry and government. After application, the design goes through an assessment by EnviroDevelopment and, if necessary, further information is sought from the development and site visits made. The development then goes to the Board for approval. Once approved, a licensing document is signed by the developer and EnviroDevelopment, the development is launched with appropriate media and the project is added to the list of EnviroDevelopment certified projects on the website (http://www.envirodevelopment.com.au/01_cms/details.asp?ID=243). There are currently 99 projects listed throughout Australia, consisting of 13 masterplanned communities, 53 residential subdivisions, 2 seniors living, 8 multi-unit residential, 14 mixed use, 4 industrial, 1 educational, 1 health and aged care, and 3 other projects.

The fee structure is:

- Registration fee: $1,000 plus GST;
- Certification fee (based on size of development): $3,000-$17,500 plus GST;
- Recertification fee: 20% of original paid annually until the project elects to let the certification lapse;

Certified developments are entitled to advertise their achievements by displaying a range of EnviroDevelopment icons. The organisation asserts that its scheme provides benefits to consumers, local government, developers as well as the environment.

The organisation runs a training course that prepares applicants for operating as an EnviroDevelopment Professional. The course focuses on EnviroDevelopment foundations, content of the EnviroDevelopment technical standards, the certification process, case studies and practical application of EnviroDevelopment to a range of development types.

Membership is open to both companies and individuals whom are product manufacturers and suppliers, service suppliers, educational bodies, government authorities and individual consultants and who service and/or participate in the development industry. Sustainability and associated professionals working for development companies (e.g. sustainability managers etc.) may also be eligible for individual memberships.

EnviroDevelopment provides consumer guidance in assessing developments and what certifications means to the consumer in terms of sustainability in building design (http://www.envirodevelopment.com.au/_dbase_upl/Consumer.pdf).

Organisation structure

EnviroDevelopment is an initiative of the Urban Development Institute of Australia (UDIA) (Queensland). The Board of Management approves projects and advises developers if they have any concerns about their development. EnviroDevelopment Coordinators are employed to provide advice to developers and work out of the relevant UDIA state office.

Stakeholders involved with the scheme

Stakeholders and organisations involved with the scheme and their roles are described in Table 4.

Table 4: Stakeholders involved in EnviroDevelopment and their respective roles.

Organisation	Roles
Calibre Consulting	EcoSystems Elements Partner
Ergon Energy Retail	Regional Events Partner
Melbourne Water	Associate Partner
PWC	Associate Partner
Ecology & Heritage partners	EcoSystems Elements Partner
Quantum United	Community Element Partner
Wood Solutions	Materials Element Partner
Urbis	Water Element Partner
The West Australian	Foundation Partner
Lavan Legal	Supporting Partner
Rocla	Supporting Partner
Water Corporation	Supporting Partner
Western Power	Supporting Partner
Hopgood Ganim Lawers	Legal Partner
URBIS	Masterplanned Communities Partner
E2DesignLab	Residential Subdivision Partner
Humes	Multi-Unit Residential Partner
Cardno	Seniors Living Partner
Plantup	Mixed Use Partner

Strengths and weaknesses/analysis

- EnviroDevelopment has a very onerous application and certification process that would not work for the PlantSure Project;
- Registration fees too high.

References

EnviroDevelopment website: http://www.envirodevelopment.com.au

HEART FOUNDATION TICK OF APPROVAL

Was a labelling mechanism aimed at consumers of food products. It encouraged people to select foods that are good for their health and heart — in particular foods that are lower in saturated fat, trans fat, salt, and kilojoules and that contain ingredients and nutrients that are better for the person, like fibre, calcium, wholegrains and vegetables.

Scheme description, rationale and logic

NOTE: This scheme was retired at the end of 2016. It had been operating for 25 years. The recent government operated 'Health Star Rating' has replaced the scheme. The Heart Foundation scheme was assessed and some additional analysis provided of the Health Star Rating.

The Tick was a self-funded public health program that aimed to improve the nutrition of the foods Australians eat most often and deliver better nutritional outcomes for all Australians. It was designed to help people easily choose healthier products at a glance when comparing foods in the same category.

To earn the Heart Foundation Tick, food manufacturers had to meet certain nutrition standards and follow promotional guidelines. If a food met these standards, the manufacturer could apply to carry the Tick. There were over 80 different product categories for the Tick. Nutrition standards set key nutrient and ingredient criteria for each category. These could include saturated fat, trans fat, kilojoules, salt, fibre, calcium and added vegetables. The criteria aimed to manage energy (kilojoules) density and ensure appropriate serve sizes, and limit levels of nutrients like total fat, saturated fat, trans fatty acids, partially hydrogenated fat and sodium and to include levels of nutrients such as dietary fibre and/or whole grains, calcium (for soy products and dairy alternatives) and protein. They also aimed to ensure the quality of categories where ingredients are important, such as vegetable content of meal related categories or ensure a minimum seafood content for seafood categories.

Promotional guidelines of the Heart Foundation covered nutrition information panels, correct use of the Tick trade mark, recipes, and compliance with current food regulations, laws and codes of practice. All packaging and promotional materials were checked (such as advertising and media releases) before they could be used. Once a food product was approved, it was monitored to ensure the standards continued to be met. Products were subject to random audits.

The Tick logo was a certification trademark. This means it had to be managed in line with Australian Competition and Consumer Commission requirements. The Tick was earned, never bought. Foods were independently tested and if a product failed to meet the standards, it would not enter the Tick program.

The program ran for more than 25 years, and according to the Heart Foundation, the Tick was the most recognised front of pack label in Australia and some 2.8 million Australians looked for it every day when they shopped for food. A year after Tick's launch in 1989, 31 companies had come on board, earning the Tick for 140 products. More than 2,000 products carried the Tick. The Heart Foundation asserts that the Tick program led to:

- nutrition information panels becoming mandatory with the update to the Food Standards Code;
- spreads with the Tick being virtually trans fat free by 2005;
- salt content in breakfast cereals, breads, and pasta sauces being reduced;
- energy criteria being introduced in breakfast cereals, dairy foods and fruit spreads.

Organisation structure

Food companies paid a licence fee once they were approved to enter the program. The fees funded the team who develop the standards, as well as nutrition research conducted by the Heart Foundation. The Heart Foundation is a federated charity and not government funded. The Tick Program ran on a cost-recovery basis.

Stakeholders involved with the scheme

It is unclear from the Heart Foundation website which stakeholders were involved with the Tick program.

Strengths and weaknesses/analysis

The Heart Foundation Tick of Approval (HFTA) was a one of a number of food labelling nutrition mechanisms used in health promotion**.** Reviews of HFTA effectiveness are mostly focused on consumer relationships with the label itself (consumer choice, understanding and interpretation — from a nutritional perspective), rather than its uptake in the marketplace or on the governance arrangements that sit behind the label. Reviews suggest the HFTA had no effect on consumer purchasing choices (Mhurchu *et al*., 2010) and could be misinterpreted and confusing for consumers with limited opportunities and limited choices available at point of purchase (Williams and Mummery, 2013; Mhurchu and Gorton, 2007) — a factor also prevalent in other food labelling programs (Cowburn and Stockley, 2005). Reviews of other health promotion food labels suggests consumers preference those that are easy to use, have interpretive content and are salient (Pettigrew *et al*., 2017). For example a colour-coding system such as 'traffic lighting' improved consumer interpretation and more effectively enabled consumers to identify healthy foods (Kelly *et al.*, 2009) with the suggestion that these may eventually make the HFTA redundant (Pettigrew *et al*., 2016) [as has indeed now been the case].

However, the HFTA was effective in other ways where it positively influenced food manufacturers to improve the nutritional value of food, for example, in the case of removing substantial quantities of salt (Williams *et al*., 2003; Mhurchu and Gorton, 2007), and salt and *trans*-fat (Thompson *et al*., 2016) from food processing, suggesting that reformulation of products by actors other than target consumers has been one of the most useful outcomes. Similarly, wider analysis of appropriate policy interventions in relation to nutrition and health promotion suggests that the most effective, albeit intrusive, measures target the market environment rather than being focused on consumer choice (Brambila-Macias *et al*., 2011).

The website does not have a lot of information about the process, for example:

- What the fee food companies pay?
- The process they went through in having their application assessed to receive a tick (e.g. how does a food manufacturer apply to get the tick and who approves their product?)
- How was monitoring of individual products done? Could a product lose its tick?
- How was the effectiveness of the overall scheme assessed?

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THE NATIONAL ASSOCIATION FOR SUSTAINABLE AGRICULTURE, AUSTRALIA

Aim is to ensure producers, manufacturers and retailers of organic products follow a specified industry standard.

Scheme description, rationale and logic

The National Association for Sustainable Agriculture (NASAA) is committed to developing and maintaining organic standards, assisting operators in gaining organic certification, and developing the organic industry in Australia. It supports the education of industry and consumers on organic, biodynamic and sustainable agricultural practices. Certified Organic (NCO) is a fully-owned subsidiary of NASAA and provides the certification services to operators within Australia, its Territories, and internationally.

The NCO is accredited domestically under the Department of Agriculture and Water Resources, and internationally through the International Federation of Organic Agriculture Movements (IFOAM). NASAA also holds accreditation under the US National Organic Program (USNOP) and Japanese Agricultural Standard (JAS). NCO certification covers some 7 million hectares and over 900 licensed operators. In addition to certifying operations within Australia, NCO is the only Australian certifier with extensive operation overseas, certifying production and processing operations in Nepal, Brazil, Papua New Guinea, Indonesia, Samoa, Malaysia, East Timor, Brazil, Solomon Islands and Sri Lanka – comprising over 12,500 small farmers. This international network ensures worldwide recognition for the NASAA Label.

The NASAA Organic and Biodynamic Standard sets out the practices and materials that are required to be certified as an organic producer. The Standard covers the organic supply chain – from input manufacturers to producers, processors to wholesale and retail operations — ensuring organic integrity 'from paddock to plate'. The standard is reviewed periodically. The most recent version was put together by the members of NASAA's Standards Committee who worked with members of NASAA's Inspection Review Committee, certification and other staff, inspectors, and certified operators themselves.

The certification process is an involved process, and in the case of farmers can take up to 36 months. It is different for primary producers, retailers and manufacturers and distributers and for Australian versus overseas applicants. Applicants go through the following basic process:

- Appraise themselves of the Standards and other relevant documents available on the NASAA website;
- Make an application using the pro-forma in the application package, which includes the application form, a questionnaire and a statutory declaration

(https://www.nasaacertifiedorganic.com.au/documents/applicationpaperwork/nasaa-domestic/267-nasaa-producer-appl-omp/file.html);

- Pay a fee (this is available on request to the organisation). The fee consists of an initial inspection fee (ranging from $220 to $545), an initial inspection (ranging from $340 to $665), and annual charges (ranging from $460 to $1160) and levy payment where applicable;
- Undergo inspection by a certified inspector;
- Inspection report reviewed by one of the NCO's Certification Officers who will contact the applicant with any non-compliance issues or issues that require following up on;
- Certification approved and use of labelling permitted;
- Further follow up inspections. Each farm is inspected annually for as long as they remain certified (a minority of farms are inspected every two years). They also conduct random unannounced inspections and targeted unannounced inspections. A farm can lose its certification completely following these inspections or may lose certification over part of the property. Retailers only require a single inspection, as do manufacturers and distributers.

Organisation structure

NASAA is a non-profit company limited by guarantee comprising an Association of Members. The Board is made up of five Directors with backgrounds in NASAA, horticulture, natural resource management, communications, small business and the non-government sector. The organisation has five staff. Membership is open to anyone who shares the aims of NASAA. General membership is $99 pa and NCO certified operators pay $77 pa. The organisation is self-funding though the fees paid.

Stakeholders involved with the scheme

The main stakeholders associated with the NASAA are organic producers.

Strengths and weaknesses/analysis

Strengths

- Fee for certification, thus making the scheme self-perpetuating
- Clear standards and process for certification
- Regular review of standards
- Follow up inspections of farmers

Weaknesses

- The approval process is too complex for the Plant Sure project
- Appears to have a narrow range of stakeholder involvement

The National Association for Sustainable Agriculture, Australia

- Does not seem to have a strong educational or outreach component
- Does not seem to have an overall monitoring system for the success of the certification scheme

References

The National Association for Sustainable Agriculture, Australia**:** https://www.nasaa.com.au/

Australian Certified Organic: https://aco.net.au/

Interview with Nyla Ahmed, Certification Officer 26 October 2017

ORNAMENTAL PLANT INITIATIVES: PLANTRIGHT (CALIFORNIA)

This scheme aims to prevent the escape of plants from nurseries into natural areas of California.

Scheme rationale and logic

The scheme works on the rationale that retail nurseries sign up to the scheme voluntarily. PlantRight develops a list of invasive plants that should not be sold ('Priority Invasive Garden Plant List') and a second list of plants of 'plants to watch'. This latter group are species the PlantRight considers meet some but not all of the criteria to be put on the Invasive Plant List.

PlantRight provides alternative species to be planted instead of each of the invasive plants. The user of their service is guided on their website through an clear and easy pictorial guide of what the invasive plants are and the alternatives species in each case. It also divides the state of California into five ecological zones and the invasive species for each zone are clearly represented.

To prepare the list of invasive species PlantRight has a sub-committee of specialists who use a decision making tool called a 'Plant Risk Evaluator'. This tool was developed by researchers at the University of Washington and University of California to determine which plants have a high risk of becoming invasive in any specific region (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0121053). They use the tool to determine which plants have a high risk of becoming invasive, which plants require more research, and which plants have a low risk of becoming invasive in a particular area.

A third list of plants is also developed of 'success stories' — plants that they call 'Retired Invasive Plants' which are species that have been retired from the Invasive Plant List when they have been observed in nurseries less than 1% of the time for three successive years (from an initial list of 19 invasive species, 15 species have now been retired).

PlantRight also has a significant educational component, with on-line educational resources on weeds (https://plantright.org/education/) as well as on-line training course (https://plantright.org/account/).

To date some 500 retail nurseries ('storefronts') have signed up as PlantRight partner nurseries according to the scheme's website. Retail partners are requested not to sell any invasive plant on the PlantRight Invasive Plant List and require the plant buyers to complete PlantRight's basic training which consists of a video, study guide and quiz on horticultural invasive plants. Once the quiz is satisfactorily completed, the nursery signs a pledge that indicates its willingness to avoid selling plants with the potential to become an invasive weed. Nursery staff are encouraged to go through the training and quiz, and PlantRight has found there to be friendly competition among staff in doing this.

The retail partners are provided with practical, science-based educational content on ornamental invasive plant issues, expert recommendations for non-invasive alternative plants,

recognition in the PlantRight online retail directory, social media, and in-store signage. According to PlantRight a key payoff for nurseries to belong to the scheme is that it shows their corporate values, and one way for nurseries and their sales staff to show 'we care'.

Organisation structure

PlantRight is a non-government organisation that brings together leaders from some 20 of California's nursery and landscape industries, conservation groups, academia, and government agencies. Its structure is composed of the following:

1. Steering Committee (17 members) — convenes quarterly;
2. Plant List Sub-committee (6 members) — responsible for drawing up and maintaining lists of invasive plants;
3. Plant Risk Evaluator (PRE) Advisory Group (13 members) — responsible for evaluating invasive potential of different plants for different regions of California using the PRE tool;
4. Staff (3);
5. Allies (21) — organisations that support PlantRight, including sharing educational materials and awareness of PlantRight, being a part of our Steering Committee and Plant List Committee, and volunteering in the annual nursery survey.

The organisation was formed in 2005 to stop the sale of horticultural invasive plants in ways that were compatible to business and the environment. Although nearly half of California's invasive plants were originally introduced through horticultural channels, no cohesive effort previously existed to work with the nursery industry to prevent the spread of invasive plants in the state. It lists its key components of its strategy as:

- Being the industry's go-to educational resource on horticultural invasive plants and suggested alternatives;
- Advocating for industry to voluntarily remove invasive plants from inventories, while promoting non-invasive alternatives;
- Preventing new invasive plants from taking root, by developing and deploying a plant risk evaluator tool, specifically for the trade.

PlantRight is a fully funded project of the California-based non-profit organisation, Sustainable Conservation (http://suscon.org). Benefits provided through this program are funded through foundation grants and out of Sustainable Conservation's annual operating budget. This situation is not long-term, and PlantRight is currently exploring options for future long term funding from Government sources, and also by charging nurseries a fee of $100-200 to get a plant assessed for its potential of becoming an invasive weed.

Volunteers involved

A significant aspect of the scheme is the involvement of volunteers who they recruit through their website using a simple method for participation. Every spring, some 170 volunteers conduct a survey of plant retailers across California to gather information about the retail market for invasive plants. A key source of volunteers is from the Master Gardeners scheme (Chalker-Scott & Collman, 2006). They do help with the survey as part of the training for becoming a Master Gardener. The Spring Nursery Survey tells PlantRight which invasive plants can be found for sale in retail markets, where they are being sold, and helps them measure what effect their retail partnerships are having. Results of the annual survey are provided on their website (https://plantright.org/survey/).

Stakeholders involved with the scheme

Stakeholders and organisations involved with the scheme include the following. These are all involved in the steering committee and the various sub-committees.

- University of California at Riverside, Department of Botany and Plant Sciences
- California Department of Fish and Wildlife
- Landscape Consultant and Educator
- Huntington Botanical Gardens
- California Native Plant Society
- Agricultural Commissioner, Contra Costa County
- California Native Plant Society, *Santa Cruz County Chapter; Landscape Design*
- California Invasive Plant Council
- California Department of Food and Agriculture
- Monrovia
- California Department of Food and Agriculture
- The Nature Conservancy
- *Belmont Nursery* AmericanHort
- California Invasive Plant Council
- Village Nurseries
- Mountain States Wholesale Nurseries
- California Association of Nurseries and Garden Centers;
- *Ag Association Management Services*

Strengths and weaknesses/analysis

Strengths:

- Well balanced steering committee with representation from nurseries, researchers, conservation organisations and government;
- Reasonable buy-in from nurseries;
- Voluntary participation for nurseries;
- High involvement of volunteers to check the scheme is working with annual evaluation survey;
- Good educational materials and on-line tutorials;
- Staff expertise and motivation in industry education and outreach, with an ability to identify the influencers and able to have an ongoing engagement with industry and build empathy amongst stakeholders
- Strategic and sensitive recognition
- Scientific basis for lists and ability to keep them up-to-date and institutional arrangements to enable industry and scientists to collaborate;
- Four types of plant lists — species considered invasive, alternative plant list, species that should be treated with caution, and those species which have been successfully eliminated from sale.
- Short plant lists — they only have non-regulated plants on the lists, that is horticultural species that have weed potential. Any plants that the government regulates (e.g. noxious weeds) do not appear on their lists. Thus the weed lists are short — a bonus for the nurseries. Also over time they are getting shorter, as species are retired. In the first year of the scheme there were 19 invasive species. Fifteen were retired and three added, so there is seven species on the current list of invasive weeds and 45 on the list of plants to be watched.
- Each year the organisation puts out a call to land managers and others in the field to let them know of species that have become concerned about. These are referred to their expert panel to conduct a preliminary analysis on and prioritise for a more detailed assessment. Plants go onto the weed lists through a process of analysis and consensus among the expert panel.

Possible weaknesses:

- Although the scheme has funding from the non-profit organisation, Sustainable Conservation, this is not seem to be sustainable in the long term and PlantRight does not have any independent income in its own right, that might be secured, for example, if nurseries were asked to pay to be participants, and occurs with some other schemes.
- Whilst the scheme requires participating nurseries to sign a pledge, there is no charter that nurseries have to follow. Where it emerges (from the survey) that a nursery that has signed

the pledge is selling invasive weeds they are contacted and requested to no longer sell the plant. This has happened only once since the scheme started, and in that case the nursery was withdrawn from the scheme and the ability of using the logo etc.

- The size of nurseries involved: larger chains are more likely and successful at participation while smaller independent stores do not participate as much because of the constraints around not wishing to miss sales.

References

Chalker-Scott, L. and Collman, S.J. 2006. Washinton State's Master Gardener Program: 30 years of leadership in university-sponsored, volunteer-coordinated sustainable community horticulture. *Journal of Cleaner Production, 14*, pp.988-993.

Plant Right (California): http://www.plantright.org/

Interview with Jan Merryweather (18 October 2017)

ORNAMENTAL PLANT INITIATIVES: GROW ME INSTEAD

Aims to prevent the escape of plants from nurseries into natural areas of Australia and becoming invasive weeds.

Scheme description, rationale and logic

Grow Me Instead (GMI) is an initiative of the Nursery & Garden Industry Australia (NGIA) promoting a positive change in the attitude of both industry and consumers toward invasive plants. Originally starting in NSW as 'Discovering Alternatives to Garden Escapes' the Grow Me Instead program now covers the whole of Australia. Funding from the Australian Government has enabled the publication of Grow Me Instead guides for each state and territory.

The various Grow Me Instead projects have identified 27 invasive urban plants in each Australian state and territory along with a range of suggested superior alternatives. Due to its size and diverse climate, the Queensland project identified 30 invasive plants in each of three bioregions, Sub Tropics, Dry Tropics and Wet Tropics. The Queensland project included funding for the establishment of a national GMI website, which integrates the information from previous GMI projects into a single web site (http://www.growmeinstead.com.au/what-is-grow-me-instead.aspx).

The invasive plant lists are not definitive for each state, territory or bioregion, there are many other plants being monitored for their invasive potential. Industry and consumers are encouraged to seek professional advice and to make the most informed plant choice possible.

The invasive plant lists were derived from weeds strategies from the different states:

- ACT Weeds Strategy 2009-2019: Department Of The Environment Climate Change Energy And Water (http://www.environment.act.gov.au/parks-conservation/plants-and-animals/Biosecurity/weeds)
- NSW Weedwise: Department of Primary Industries (http://weeds.dpi.nsw.gov.au)
- Declared Weeds in the Northern Territory: Department of Environment and Natural Resources, Northern Territory (https://nt.gov.au/environment/weeds/declared-weeds)
- Invasive Plants: Queensland Government (https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/land-management/health-pests-weeds-diseases/weeds-diseases/invasive-plants)
- Weeds and Pest Animals: Primary Industries and Regions, Government of South Australia (http://www.pir.sa.gov.au/biosecurity/weeds_and_pest_animals)
- Department of Primary Industries, Parks, Water and Environment
- Victoria's consolidated lists of declared noxious weeds and pest animals: Agriculture Victoria (http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/protecting-

victoria-from-pest-animals-and-weeds/legislation-policy-and-permits/declared-noxious-weeds-and-pest-animals-in-victoria)

- Declared plant links: Department of Primary Industries and Regional Development (https://www.agric.wa.gov.au/declared-plants/declared-plant-links)

The website project is built on the NGIA Invasive Plants Policy Position which articulates the role of nurseries in reducing plant invasions (http://www.growmeinstead.com.au/public/NGIA-Invasive-Weeds-Policy.pdf).

Organisation structure

The Grow Me Instead website has been supported by the Nursery & Garden Industry Australia through funding from the Australian Government's Caring for our Country. There appears to be no specific organisation with the role of on-going management.

Stakeholders involved with the scheme

Stakeholders and organisations involved with the scheme and their respective roles are described in Table 5.

Table 5: Stakeholders involved in Grow Me Instead and their respective roles.

Organisation	Roles
Caring for Our Country program — Australian Government	Funding
Nursery & Garden Industry, Queensland	Project management
Nursery & Garden Industry NSW & ACT (NGINA)	Policy position on the role of nurseries in reducing invasive species

Strengths and weaknesses/analysis

This scheme appears to have been a one-off initiative where the compilations of lists and the website were funded, but with no follow up with nurseries. The project's focus is on providing educational materials to potential clients of nurseries but does not appear to have a means of ensuring nurseries do not sell the plants.

It seems to be a very narrow band of stakeholders involved (just the nursery industry itself, with some input from government via funding, and information about weeds that could be sourced.

It is unclear how the weed lists were developed and whether an expert panel was involved, and whether there is a means to update the lists.

There appears to be no way of ensuring that nurseries do not sell invasive species. The scheme seems to be basically an information project aimed at potential customers.

There also appeared to be no organisation that took responsibility for the on-going management of the scheme.

References

Grow Me Instead website: http://www.growmeinstead.com.au/

ORNAMENTAL PLANT INITIATIVES: NURSERY INDUSTRY ACCREDITATION SCHEME AUSTRALIA (NIASA)

This scheme aims to encourage plant nurseries and growing media suppliers to adopt best practice.

Scheme description, rationale and logic

The Nursery Industry Accreditation Scheme (NIASA) is a national scheme for production nurseries — growers and growing media — potting mix businesses that operate in accordance with a set of national 'best practice' guidelines. The Nursery and Garden Industry Australia Limited (NGIA) has several accreditation schemes that are designed for nurseries to improve their business. According to the NIASA, by providing benchmarks for a standardised level of quality, the accreditation provides consumers and the industry with an assurance that the business they are dealing with is committed to the highest quality business practices, consistency and reliability in delivering service, professional standards and dedication to continuous improvement.

The NGIA in partnership with Horticulture Australia Limited developed the EcoHort guidelines that provide a systematic approach for production nurseries to assess their environmental and natural resource management responsibilities. This is the industry specific set of guidelines or Environmental Management System and is a method by which a grower can demonstrate to industry, government and the community their sound environmental and natural resource stewardship (http://nurseryproductionfms.com.au/ecohort-certification/)

The NIASA and EcoHort guidelines have been approved by Smart Approved WaterMark as approved services. This voluntary scheme was established to assist in the reduction of per capita water consumption by acknowledging water efficient products and services (see pages 22-24 of this report). All current NIASA and EcoHort businesses have been contacted by NGIA advising them of the many ways the Smart Approved WaterMark label can be used. The NIASA Best Practice Guidelines have been developed over a period of years by respected industry representatives and researchers. The guidelines describe industry 'Best Management Practice' spelling out technical and management requirements. for production nurseries and growing media supplier businesses (Cost $99). The guidelines are regularly reviewed, ensuring they cover relevant and current production and environmental issues.

Any wholesale/production nursery or growing media/potting mix manufacturer in Australia can join NIASA if they implement the NIASA Best Practice Guidelines. Membership is voluntary and participants are not required to belong to a nursery and garden industry association. Businesses and business practices are independently assessed to ensure they meet the standards.

The Accreditation Schemes are developed by the nursery products levy and the Commonwealth Government via Horticulture Innovation Australia. The NIASA is funded by the nursery levy (an annual levy based on number of plants sold that is paid by all nurseries to the NGIA) (see https://www.ngia.com.au/Category?Action=View&Category_id=326).

Organisation structure

The NGIA is the peak industry body representing commercial growers, retailers and suppliers in Australia. Its Board is made up of seven directors, each elected by the state or territory nursery and garden industry association, and each having a background in the nursery industry. It is charged with providing leadership, support and additional resources to drive key industry initiatives, which meet the goals of the industry strategic plan. Individual nurseries can become members of their state association and thus automatically become members of the national body. The organisation has eight staff.

Stakeholders involved with the scheme

The organisation appears to only involve stakeholders and organisations from the nursery industry itself.

Strengths and weaknesses/analysis

Strengths:

- Independent funding (from nursery levy)
- Well defined guidelines to provide an industry standard

Weaknesses

- Narrow stakeholder base (appears to be largely nurseries)
- Process of developing the best-practice guidelines, standards and benchmarks not very transparent (it is unclear who developed the guidelines and who reviews them
- Unclear if businesses are assessed to determine if they are complying with the guidelines, whether the overall scheme is monitored for effectiveness and what happens if a business does not comply with the guidelines

References

NIASA (Nursery Industry Accreditation Scheme Australia) website:
https://www.ngia.com.au/Category?Action=View&Category_id=125

OTHER SCHEMES

Australian Ethical

https://www.australianethical.com.au

Has a charter with which it assesses all companies that it considers investing in (https://www.australianethical.com.au/australian-ethical-charter/). The charter covers treatment of people, sustainability and quality. If the company does not measure up against the charter, Australian Ethical does not invest in it. It reviews its investment decisions and will withdraw its investment from a company if it judges that it no longer is consistent with the charter.

Certified B Corporations

http://bcorporation.com.au

A global accreditation for companies who identify as making a contribution to the world, as judged to be complying with code of ethical and sustainable principles. Standards are created and revised by the Standards Advisory Council. Interested companies undertake an assessment by filling out a questionnaire and being interviewed by staff. Certified B corporations are reviewed at random (10% annually) and to maintain certification the company must redo its assessment every two years.

Ethical Clothing Australia

http://ethicalclothingaustralia.org.au

A voluntary accreditation scheme for clothing manufacturers operating in Australia to ensure they are legally compliant and transparent and protects the rights of factory-based workers and outworkers. Accreditation is gained through an assessment process and has to be reapplied for annually.

Fairtrade Australia

http://fairtrade.com.au

Fairtrade advocates for better working conditions and improved terms of trade for farmers and workers in developing countries. Companies have to comply with the Fairtrade standard. They submit and application which is assessed independently.

Global Organic Textile Standard

http://www.global-standard.org

The Global Organic Textile Standard (GOTS) is the worldwide leading textile processing standard for organic fibres, including ecological and social criteria, backed up by independent certification of the entire textile supply chain. Textile processing, manufacturing and trading entities can apply for certification according to the Global Organic Textile Standard. The certification process appears similar to Certified Organic.

Other schemes

OEKO-TEX

https://www.oeko-tex.com/

The STANDARD 100 by OEKO-TEX is a worldwide consistent, independent testing and certification system for raw, semi-finished, and finished textile products at all processing levels, as well as accessory materials used. The precondition for the certification of products in accordance with OEKO-TEX Standard 100 is that all parts of an article meet the required criteria — in addition to the outer fabric, for example, also the sewing threads, inserts, prints etc., as well as non-textile accessories, such as buttons, zip fasteners, rivets etc.

Australian Forest Standard

http://www.forestrystandard.org.au/

Alternative forestry standard run by the forest products industry. A set of standards have been developed with which forest managers or other parts of the production chain need to comply. Independent certification is provided by an accredited certification body.

Government Health Star rating

http://healthstarrating.gov.au/

The Health Star Rating system uses stars to show the nutritional profile of packaged foods and is joint initiative of the Australian, state and territory governments. It is a voluntary scheme for food manufacturers and retailers.

5. Comparative Analysis Between Schemes

Each scheme was assessed using the 21 design parameters provided in the project brief as well as a further three criteria that were added by the project team following the literature review (see Methods chapter and Table 2). The overall comparison is presented in Table 6.

Schemes that are suitable as a model for the Plant Sure Scheme

- PlantRight — overall scheme is ready-made to be adopted by Plant Sure, with some modifications.

Schemes that would not work as a model for the Plant Sure Scheme but which have some features that could be incorporated into the Scheme

- Heart Foundation Tick — use of application fee as a means of self-sustaining
- Forest Stewardship Certification — third-party monitoring, guiding principles and criteria
- Grow Me Instead — the use of state government derived weed lists
- ISO 14001 — voluntary self-assessment based on a technical standard
- Smart Approved Watermark — assessment process and application fee as a means of being self-sustaining
- Nursery Industry Accreditation Scheme — fee, best practice guidelines
- Certified Organic — fee, standards, monitoring and evaluation

Schemes that are unsuitable as a model for the Plant Sure Scheme

- Greenbiz — inadequate information about the Scheme to use as a model.
- EnviroDevelopment — certification process far to onerous or expensive.

Table 6: Comparison between schemes, standards and/or initiatives with respect to the PlantSure scheme.

See Table 2 for scoring system. Cells with ? mean this factor is unclear.

Design Parameter	Smart Approved Watermark	Forestry Stewardship Certification	GreenBizCheck	ISO 14001 International Standard	EnviroDevelopment	Heart Foundation Tick of Approval	Nat Assoc for Sust Ag: Australian Certified Organic	Grow Me Instead	NIASA	PlantRight (California))
1. Identifiable brand	1	1	1	1	1	1	1	0	1	1
2. Equitable access	3	3	2	3	2	3	3	1	3	3
3. Stakeholder mapping	Not scored									
4. Non-exclusive	1	1	1	1	1	1	1	1	1	1
5. Standardised & simple approach	3	3	2	3	1	2	3	1	3	3
6. Transparent, independent, robust	2	3	1	2	3	1	3	1	1	3
7. Appeals to industry stakeholders	3	3	?	3	3	3	3	3	3	3
8. Independent and self-sustaining	3	3	?	3	3	3	3	1	3	2
9. Enables broad stakeholder engagement & consultation	2	3	?	3	?	1	1	1	1	3
10. Encompasses independent expertise	1	1	1	1	?	1	1	1	1	1
11. Based on a dynamic agreed decision support tool	0	0	1	0	0	0	0	0	0	1
12. Allows removal of high risk species from trade	Not scored									
13. Uses agreed categorisation of high risk plants	Not scored									
14. Allows for collaboration with similar programs/projects	2	?	?	3	?	?	2	3	1	3
15. Contains robust consumer education methods	3	1	2	1	2	3	2	2	1	3
16. Able to be adapted or expanded cross-jurisdictional level	1	1	1	1	1	1	1	1	1	1
17. Includes dvpt of a business plan to ensure scheme viability	Not scored									
18. Includes transparent and appropriate audit and compliance processes	1	1	1	1	2	1	2	1	1	3
19. Includes option for an institutional home	1	1	?	1	1	1	1	1	1	1
20. Includes mechanism for conflict resolution for industry, community and government	1	3	?	2	?	?	?	1	?	3
21. Ensures focus on positive environmental, economic and social outcomes	2	3	1	2	3	1	2	1	1	2
22. Has strong participation (recruitment and retention of membership)	2	3	?	3	2	?	3	1	3	2
23. Has standards that signal intent of organisation and required practices of members	1	3	?	3	3	1	3	2	3	2
24. Monitors standards, whether group is meeting its aims and if members are complying	1	1	?	?	?	1	1	1	1	2
TOTAL	**34**	**38**	**14**	**38**	**28**	**25**	**36**	**24**	**31**	**42**

6. Recommendations

The project brief was to ultimately arrive at a series of recommendations about the best form of a voluntary scheme for the green life industry to avoid the movement of potential weed species into natural areas. Figure 1 summarises the key elements of such a scheme.

We (the authors of this report) expect that in arriving at the final shape of the Scheme, considerable discussion will be required among the stakeholders and steering committee of the project. The significance of this discussion and ongoing stakeholder consultation is important not only in shaping the eventual Scheme, but also to facilitate ownership, or a shared narrative of the Scheme and its objectives, and ultimately the success of the Scheme. A workshop is scheduled in Feb 2018 to explore the various scheme design considerations presented in this report. Therefore we offer the following recommendations and options in this version of the report as a means of guiding those discussions (see in particular Table 15 which sets out the key decisions that will need to be made), with the expectation that the final version will be refined following further discussion by stakeholders and the steering committee.

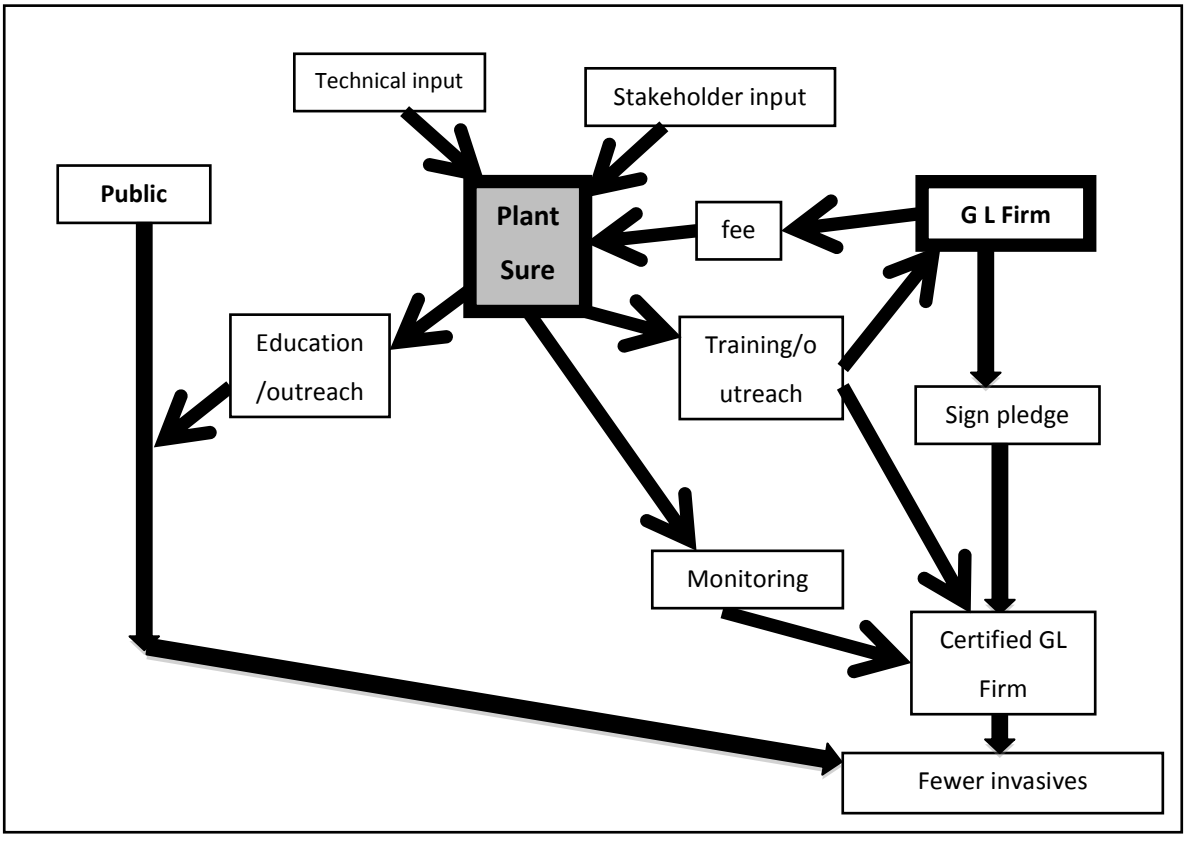

Figure 1: Overall structure of a model scheme to prevent the sale or use of potential invasive species by the firms of the Green life industry ('GL Firm').

The main purpose of the Scheme is to instigate long term behaviour change, which requires changing norms within the industry. Table 7 sets out a series of strategies and actions that have been found in the scholarly literature as inculcating and diffusing norms in voluntary environmental programs. These strategies have informed the recommendations which follow.

Table 7: Strategies and actions for inculcating and diffusing norms in voluntary environmental programs (VEPs).

Strategy	Action Examples
Foster legitimacy from early on through participatory and inclusive scheme governance	Set rules and standards in a participatory and inclusive manner.
High level support and accountability	CEOs/owners responsible for certification and/or (annual) assessments and sign off.
Mainstreaming adoption of VEP and its elements, including any charters, standards etc.	VEP adoption required for industry association membership
Language and values	Standards, charters, codes: Ensure that such documents and statements make clear the 'new normal' – i.e. the parameters and values that mark internal and external expectations and values regarding industry practice and the social, environmental, or economic role of industry. E.g. accepting that the plant industry has an important role to play in minimising new weed introductions.
Assist with adoption, promote reflexivity, and continuous improvement.	Work with firms to help them integrate new standards and values into their structures, operations, and processes.
	Provide fora where firms can discuss problems, and find solutions, including learning from each other and leading firms.
	Incorporate evaluation, reflection, and improvement processes into certification.
Coercive Forces	Revealing performance of firms: Can be public or 'in house': publicising poor performers in industry fora/meetings can (arguably) exert pressure without public embarrassment.
Promote change by mimetic processes (Mimesis: 'The deliberate imitation of the behaviour of one group of people [or by an organisation] by another as a factor in social change' (OED), whereby the "identity" of the former is assimilated by the latter but difference is maintained); That is, becoming by doing (what your peers do)	Standards, codes, charters can include guidelines, requirements, or information in such as a way as to provide clear actions or steps that firms can take to improve their performance in the context of their circumstances.
	Build social networks through workshops, forums, and one-on-one engagement in which firms can both receive and exchange information about the scheme, how it works, and experiences in implementing it.
Positive reinforcement	Provide rewards and recognition for good performance

Sources: Dare *et al*. (2011); Gulbrandsen (2005); Kalfagianni and Pattberg (2013); King and Lenox (2000); Koehler (2007); Rametsteiner and Simula (2003) — see references in Literature Review.

SCOPE OF SCHEME

We envisage that the green life industry could be divided into two distinct components: the producers and suppliers of plants (e.g. retail nurseries, wholesale nurseries, plant breeders, etc.) and the users of plants (e.g. landscapers, landscape designers etc.). Crucially, the stakeholder mapping tasks will be required to confirm (or refute) this point, and chart the depth and breadth of the industry relevant to the scheme. Users of plants also include organisations such as State or local government. At the end of the supply chain is the individual consumer who puts the plants in the ground. In some cases there will be overlap between different parts of the supply chain — for example, a local council might both produce plants, and also put them in the ground.

A fundamental decision the steering committee will need to make is the scope of the Scheme with the following questions in mind: should it be orientated solely at the producers/suppliers of plants, or should it try and encompass other parts of the supply chain as well, such as landscapers. The advantages and disadvantages of these two alternatives are provided in Table 8.

Table 8: Advantages and disadvantages of the different alternatives for the scope of the Scheme.

Option for the Scheme	Advantages	Disadvantages
1. Be orientated solely at the producers/suppliers of plants	• The Scheme would be much simpler, both conceptually and in practice	• Would not include key players of the green life industry, notably landscapers
2. Be orientated for organisations throughout the supply chain, from producers of plants to users of plants	• The Scheme could encompass many different types of organisations and players within the green life industry • Parts of the supply chain that use plants could put pressure on the producers of plants to only sell non-invasive plants and vice versa • Potentially greater scope for financial viability (greater range of organisations that could be charged to belong)	• Would be much more complex to organise, and potentially make the Scheme unworkable.

Different schemes examined as part of this review adopted one or other of the approaches summarised in Table 8.

The PlantRight scheme is aimed solely at the producers/suppliers of plants. Schemes that encompass other parts of the supply chain include Forestry Stewardship Certification, Smart WaterMark, ISO 14001 and Certified Organic.

Having the Scheme solely for the producers and suppliers of plants would be much easier to organise and monitor. It could be argued that if the producers do not supply invasive plants, then the users of plants would not be able to use them. On the other hand, other parts of the supply chain (such as landscape designers) can create the demand for particular species and if they were not included in the Scheme that might be to the Scheme's detriment. This issue could be circumvented to some degree, by having different parts of the supply chain, and in particular landscapers and landscape designers, represented on the Steering Committee (see Recommendation #2) and the Technical Panel(s) (see Recommendation #4). An alternative approach might be to have the Scheme orientated or staged initially towards suppliers/producers of plants and to then later expand it to include other elements of the supply chain.

RECOMMENDATION 1

That within a facilitated workshop, the Plant Sure Scheme steering committee explores the following three options for the scope for the Scheme with a view of deciding which will be most appropriate:

(a) Orientate the Scheme solely at the producers/suppliers of plants;

(b) Orientate the Scheme at all key parts of the supply chain of the green life industry; or

(c) Commence the Scheme orientated at just at producers and suppliers of plants and then later encompass other parts of the supply chain as well.

INSTITUTIONAL HOME

It is essential that the Plant Sure Scheme has an institutional home which will provide it with long-term sustainability, be readily accessible and acceptable to the green life industry and be respected by government, research and non-government stakeholders. Most of the schemes examined had independent organisational homes (that is they were not attached to a government department). Some were attached to a non-government organisation (e.g. Smart Approved Watermark, PlantRight, Heart Foundation Tick, Forestry Stewardship Certification, ISO14001), while others were attached to private sector organisations (e.g. Nursery Industry Accreditation Scheme Australia, EnviroDevelopment, Certified Organic). The exception to these appeared to be the GrowMeInstead website and GreenBiz which did not appear to have organisational homes. Of these, some schemes were wholly independent entities, while others fell under the auspices of their sponsoring organisation.

The four main options available for an organisational home for this scheme are provided in Table 9, with advantages and disadvantages of each. Option 1 (to be part of a government agency) and Option 3 appear to have too many disadvantages to pursue, although a longer term plan could be to transition to an independent non-government organisation once the scheme is sufficiently established. The PlantRight

scheme is a fully funded project of the non-profit organisation, Sustainable Conservation and this has worked very effectively up until now, (although now the funding is ending PlantRight is looking for new funding). A similar arrangement could work for the Plant Sure Scheme if an appropriate organisation could be found. The NIASA scheme is funded by and hosted by the NGIA. In terms of hosting the Plant Sure Scheme, the fourth option would appear to be the easiest, in that there is already a precedent in terms of the NIASA already being run through the NGIA. On the other hand the NGINA (Nursery and Garden Industry NSW and ACT) is a driving force within the consortium to develop the Scheme and might be a more appropriate industry organisation while the Scheme is based in NSW.

Table 9: Advantages and disadvantages of different types of institutional home.

Option for Institutional home	Advantages	Disadvantages
1. Be a separate body within a government agency	• Access to institutional resources (e.g. access to weed lists or expertise)	• May be viewed with distrust by one sector of stakeholders (depending on which government agency) • Unlikely to be able to get an agency to provide the home • Problems when transferring to other states if a NSW state department is selected • Funding and institutional support could be erratic and dependent on the policy climate of the time
2. Be part of an existing non-government organisation	• Access to the resources of the existing organisation • Independent of industry players, and can take a more neutral and altruistic approach	• May have difficulty getting buy-in from the nursery industry (although in the case of PlantRight this has not been a problem)
3. Create a new non-government organisation	• The organisation would be completely independent	• Start up without resources could be difficult • Appears to have no ready foundation
4. Be part of an industry association	• Good buy-in from the nursery industry and other Green life industry players	• May have difficulty getting buy-in from non-government organisations • Could be problematic with vested interests (e.g. if a nursery that is a member of the Scheme is found to be non-compliant)

RECOMMENDATION 2

That the steering committee consider providing an institutional home either in an existing non-government organisation or within an industry association and that these two options be workshopped further by the consortium to determine which is the most viable. If an existing organisation is deemed to be the best option,

a third option should be explored whereby the existing organisation is an interim arrangement to get the scheme up and running with the aim of it becoming independent if it is a success.

[Design Parameter # 19]

GOVERNANCE: STEERING COMMITTEE OR BOARD

Most of the schemes examined had some kind of panel or group that oversaw the scheme. In some cases the organisation was a non-government organisation and had a Board of directors (e.g. Smart WaterMark, Forestry Stewardship Certification, ISO14001, Heart Foundation). One organisation had a steering committee (Plant Right). The schemes that were run by industry groups (such as EnviroDevelopment and the Nursery Industry Accreditation Scheme) were overseen by a Board of directors. With two of the schemes (Greenbiz and Grow Me Instead) it was unclear what the governance structure was.

Of these governance arrangements the one that stood out as being the most appropriate for the Plant Sure Scheme, what that of the PlantRight scheme. Its steering committee had very broad stakeholder involvement which included 20 representatives from nursery and landscape industries, conservation groups, academia, and government agencies. Many of the other schemes had Boards with rather narrow stakeholder involvement. For the Plant Sure Scheme to be effective and be able to get buy-in from the broad range of stakeholders (nursery industry, landscaping industry, research community, non-government organisations, government) the steering committee approach would appear to be the best model.

If a new non-government organisation is to be set up to run the scheme, an additional Board of directors might be considered, however the steering committee could possibly fulfil this role.

The disadvantage of having a larger steering committee over having a smaller Board of directors, is that it might be more unwieldy to organise, more difficult to organise frequent meetings, and more difficult to reach decisions. A Board of directors may provide a higher standard of governance than a steering committee and allow the Scheme to function independently either as a stand-alone entity or one hosted by another organisation. Directors could be sourced from industry groups, conservation groups and agencies. Notwithstanding these advantages of having a smaller Board, the advantages of having wide stakeholder buy-in for a larger steering committee would appear to outweigh the disadvantages.

RECOMMENDATION 3

That the Plant Sure Scheme be governed by a steering committee composed of representatives from nursery and landscape industries, conservation and bush regeneration groups, academia, and government agencies.

EXPERT PANEL(S)

With all the schemes examined, there was some form of technical grouping that had various functions relating to the technical side of the scheme, including assessing applications, certifying applications and writing and reviewing standards. The different models are depicted in Table 10. It was difficult to determine how some schemes carried out the technical aspects of the scheme (e.g. GreenBiz, Grow Me Instead, NIASA).

Table 10: Different types of technical involvement.

Option for Technical group	Example	Roles
1. Two separate technical committees	PlantRight	One group reviews the potential invasiveness of particular horticultural species. A second group is responsible for generating the lists of plants.
2. Single technical panel	Smart WaterMark	Assesses and approves applications
	ISO14001	Writes and reviews standards
3. Single technical panel plus staff	Certified Organic	The panel writes and reviews standards while staff assess and certify applications
4. Staff in conjunction with Board	Heart Foundation Tick of Approval	Staff write standards and approve products
	EnviroDevelopment	Staff assess applications and Board approves them
5. Independent certifying body	Forestry Stewardship Certification	Assesses and certifies applications

For the Plant Sure Scheme, the best model appears to be that of the PlantRight scheme. In this scheme they use the services of a broad range of stakeholders (many of them already on the steering committee), and have them arranged into two technical committees. The first uses the decision-making tool to assess the potential weediness of particular species. This job is highly technical and can be quite time-consuming. Particular nurseries or other stakeholders can identify species for assessment, and the committee will assess those species they deem to be the most likely to become weeds. The second group (again with overlap with both the steering committee and the technical committee) is responsible for producing the lists of plants. It generates four lists: species considered invasive (high risk); alternative plant list; species that should be treated with caution; and those species which have been successfully eliminated from sale.

Whilst the PlantRight Scheme has two technical committees there would be no reason why a single committee with appropriate representation could not do both tasks (as is done by some other schemes).

It is important to note that the PlantRight scheme is characterised by a list of invasive species that they have identified as not being desirable to sell that is very short (originally only 19 species and now with the retirement of many species that are not being sold any more, just 7). Any plants that are regulated by

government are not on the list. The lists are regionally specific and each bioregion has its own list. Of considerable importance to the success of the scheme is that it provides recommended alternative plants that be can grown in the place of each of those listed. The scheme is also supplemented with excellent education and outreach services and industry and stakeholder networking. Each of those aspects should be incorporated into the Plant Sure Scheme.

An alternative to the production of lists as described above, would be to base the scheme on an approach whereby each customer and/or nursery would do their own risk based assessment of each species to be sold or bought based on the decision making tool. This is not an approach used by schemes that we have reviewed and would require deliberation as to how a practical and credible scheme based on such an approach would operate. At this stage, it is difficult to see how this approach would work as it would depend on each customer or nursery spending considerable time doing the assessment. As it is likely that each assessment would take several hours it is not very likely that many nurseries or customers would do this. It would also make the scheme difficult to monitor. If a set list is not in existence of the identified invasive (high risk) species that the scheme has identified as undesirable for sale, there would be no practical way to monitor nurseries to ensure those plants are not being sold. Further, as scheme credibility may at least partly depend on the presence of expert assessment in some way, plant assessment outside of such expert assessment would need to be carefully considered.

Some schemes have a technical committee to develop standards that applications should follow (e.g. ISO14001, Certified Organic, NIASA). This is a highly desirable component of any successful Voluntary Environment Program (see Literature Review) and has the benefit of resolving any different approaches or conflicts among stakeholders. In some schemes we examined, a technical committee actually writes the standards, while in other cases the committee oversees the production of the standards (which are drafted by staff). Other organisations have a charter that sets out a set of guiding principles for the industry to follow.

Charters or standards can vary considerably in scope. At one end of the spectrum there is a simple charter that spells out a set of principles (such as Australian Ethical which sets out a set of statements that govern their decision-making regarding investment — https://www.australianethical.com.au/australian-ethical-charter/). At the other end of spectrum are programs such as the Forestry Sustainability Certification with its ten Principles of Responsible Forest Management (not dissimilar to the Australian Ethical Charter (https://ic.fsc.org/en/what-is-fsc-certification/principles-criteria/fscs-10-principles). But in the case of the FSC, these principles are spelt out in greater detail in the document 'International Generic Indicators' (http://igi.fsc.org/approved-documents.60.htm) and the 'FSC International Standard' (https://ic.fsc.org/en/document-center/id/59).

RECOMMENDATION 4

That the Plant Sure Scheme adopts a similar model to PlantRight with one or two technical expert committees to carry out the risk assessment of particular species using an appropriately designed decision-making tool and to generate four regionally specific lists, based on the risk they pose for the environment: species considered invasive (or high risk), alternative plant list; species that should be treated with caution (that is, species of medium risk); and those species which have been successfully eliminated from sale. The list of high risk plants should be as short as practicable and not include species that are already regulated. In addition the technical expert committee(s) should generate (or oversee the production of) a set of standards or charter for the certified scheme members to follow with regards to the sale and use of potentially invasive (high risk) species.

[Design Parameters #6, #9, #10, #11, #13, #20 and # 23]

FUNDING

Ensuring the scheme is properly funded will enable it to endure into the future. There are several options (see Table 11).

Table 11: Different options for funding the scheme.

Option for funding	Example	Notes
1. Application fee or assessment fee	EnviroDevelopment Forestry Stewardship Certification Certified Organic Smart WaterMark	The organisations that have fees are wholly independent and self-sufficient. Generally they scale their fees depending on the size of the applying organisation.
2. Licence fee, certification fee or administration fee that is renewed annually or every two years, or fees for particular services	EnviroDevelopment Forestry Stewardship Certification Certified Organic Smart WaterMark Heart Foundation Tick of Approval	
3. Grants	PlantRight Grow Me Instead	Reliance on grants has the disadvantage of not being sustainable into the long term
4. Government budget	None of the schemes investigated	
5. Industry levy	Nursery Industry Accreditation Scheme	Requires an organisation to divert existing funds
6. Self funded from organisational funds	ISO14001	
7. Sale of some kind of service		

Organisations that charge some kind of fee (whether it is an initial application fee and/or an annual licence, certification or administration fee) are more sustainable into the long term than those relying on government

grants. The option of using part of an industry levy (the only one feasible being the nursery industry levy) might be easier to organise if an industry group becomes the host organisation. Having the scheme self-funded from organisational funds such as done by the Heart Foundation Tick of Approval would appear to be impracticable unless an organisation emerged that wished to fund such a Scheme.

Usually the fees charged by schemes are scaled depending on the size of the organisation applying and the scale of the proposal (see Table 12). In the case of EnviroDevelopment, which is dealing with large developments, the certification fee is $1000 and the licence fee is $3000-$17,500. On the other end of the scale, Smart WaterMark and Certified Organic are dealing with smaller companies or smaller proposals and their scale ranges from a few hundred dollars to $1,500 depending on the size of the proposal and type of organisation applying.

As part of Phase 2 of the project, an analysis within a Business Plan should be done to find out:

- The likely percentage of green life organisations with interest and capacity to participate in the Scheme, of each category (e.g. big box retailers, medium sized retailers and small independent retailers);
- The level of fees the green life industries would be willing to pay (we would expect this to be in the range of $1-200 for small companies up to around $1,500 for very large retailers);
- The fees necessary to sustain an organisation employing a minimum of three staff (approximately $500,000 pa).

Table 12: Fee scales.

Option for funding	Example	Fee ($)
1. Application fee or assessment fee	EnviroDevelopment	1,000
	Smart WaterMark	350-1,500
	Certified Organic	220-545
	Forestry Stewardship Certification	Determined by certifier
2. Licence fee, certification fee or administration fee that is renewed annually or every two years	EnviroDevelopment	3,000-17,500
	Smart WaterMark	350-1,500
	Certified Organic (initial inspection)	340-665
	Certified Organic (annual fee)	460-1,160
	Forestry Stewardship Certification	Determined by certifier
	Heart Foundation Tick of Approval	At a rate to fund the scheme

RECOMMENDATION 5

(a) That the Plant Sure Scheme undertakes the development of a business plan as part of Phase 2 of the scheme, to ensure that it is viable into the long term. The business plan should identify opportunities for seed funding and collaboration with similar programs and projects to share knowledge and resources, identify synergies and opportunities and avoid duplication;

(b) That market research is conducted to determine the most appropriate fee structure, based on the likely number of green life organisations that would participate and the amount differently sized nurseries would be prepared to pay;

(c) That industry and other relevant stakeholders be involved in discussions about fee setting;

(d) That applicants pay an initial joining fee scaled depending on how big the organisation is (e.g. < 5 employees; 6-20 employees and non-government organisations; companies with more than 20 employees and government organisations);

(e) That participants in the Scheme pay an administration fee every two years of about the same amount as the initial joining fee; and

(f) Other sources of funding outside fees and industry levies be investigated such as charging fees to undertake species risk assessments and charging royalties to label and use particular species as 'champions' (that is safe for the environment).

[Design Parameters #4, # 8, #14 and #17]

ASSESSMENT OF APPLICATIONS: ACCREDITATION/CERTIFICATION

The International Organization for Standardization (ISO) provides the following definitions of accreditation and certification:

- **Accreditation** entails the endorsement of a body's competence, credibility, independence and integrity in carrying out its conformity assessment activities. This enhances the authority of conformity assessment bodies when conducting certification and inspection assessments. The ISO defines accreditation as a third-party attestation related to a conformity assessment body which convey formal demonstration of its competence to carry out specific conformity assessment tasks.
- **Certifications** are sought from conformity assessment bodies to demonstrate an applicant's compliance with specified standards and defined by the ISO as a third-party attestation related to products, processes, systems or persons. In essence, certifications are third-party endorsements of an organisation's systems or products, while accreditation is a third-party endorsement of the certification. (http://www.jas-anz.org/accreditation-or-certification)

For the Plant Sure Scheme the relevant category is recommended to be 'certification'. Individual organisations (nurseries etc) would be certified that they are not selling or using high risk plants. The implication of accreditation is that there are higher levels of enforcement to a recognised standard by an authoritative body, which do not currently exist and which also implicate significantly more cost and resource requirements. It should be recognised that the terms certification and accreditation are often used interchangeably in different general and professional settings, and that these terms may have different meanings for the potential stakeholders of the Scheme.

The various schemes investigated had different approaches to assessing participants and accrediting or certifying them. The approaches fell into one of four models:

- MODEL 1: Assessment of applications is done by staff and the applicant is certified as being compliant (e.g. Certified Organic, EnviroDevelopment);
- MODEL 2: Assessment of applications is done by a technical panel of experts and the applicant is certified as being compliant (e.g. Smart WaterMark);
- MODEL 3: Assessment of applications is done by a certified third party assessor and the applicant is certified as being compliant (e.g. Forestry Stewardship Certification);
- MODEL 4: Potential participants self-assess or are not assessed and they receive some form of accreditation or certification (ISO14001, PlantRight, Grow Me Instead, NIASA, GreenBiz).

Whilst there are four distinct models, the real difference of approach is between schemes in which there is some form of assessment (Models 1, 2 and 3) and schemes in which there is no assessment or the applicant self-assesses. There are pros and cons for each approach. On one hand having rigorous assessment results in higher standards being maintained, however considerably more staff resources and funding is required. On the other hand a wholly voluntary approach in which the individual company does training and self-assesses (exemplified by the PlantRight scheme) may encourage more green life organisations to become involved and would be cheaper to administer, but might not be as rigorous in maintaining standards. In the case of PlantRight, the nursery undertakes training and has to pass that training before being certified, but is not individually assessed. The assessment happens at the industry scale when nurseries are monitored in the annual survey. Therefore this approach would mean that less stringent standards might apply to individual organisations and greater weight would be have to be placed on the overall monitoring of the scheme to ensure that the scheme has the desired effect on the sale of potentially invasive (high risk) plants.

Of Models 1, 2 and 3, Model 3 may not be inappropriate for the Plant Sure Scheme as it would be too onerous and expensive. Both Models 1 and 2 have merit and could easily be translated into the Scheme, as could Model 4. The number of assessments done each year in Models 1 and 2 would depend on the number of applications. Presumably the staff or technical panel would need to group applications and

examine them a number of times each year. The number of times per year that assessments are done and who does the assessment would have cost implications to the Scheme.

The question of which model is chosen is a fundamental one to the design of the Scheme and should be a focus on the facilitated workshop to come to a final decision. Our recommendation is drafted accordingly.

RECOMMENDATION 6

That within a facilitated workshop, the Plant Sure Scheme steering committee explores the following four models for assessing potential participants in the scheme and provides an indication of which one stakeholders would prefer:

- MODEL 1: Assessment of applications is done by staff and the applicant is certified as being compliant;
- MODEL 2: Assessment of applications is done by a technical panel of experts and the applicant is certified as being compliant;
- MODEL 3: Assessment of applications is done by a certified third party assessor and the applicant is certified as being compliant;
- MODEL 4: Potential participants self-assess or are not assessed and they receive some form of certification.

[Design Parameters #5 and # 18]

BRANDING

All the schemes examined had a clear brand and once an organisation had been certified it had the right to document this by displaying the brand at their place of business and by using appropriate signage or on promotional platforms. There are two approaches that might be employed by the Plant Sure Scheme:

1. Complying organisations are certified and branded; or
2. Individual plants are branded as 'environmentally-safe'.

Some schemes that were reviewed adopted the second of these approaches, for example the Smart WaterMark, in which individual products were certified. There are two reasons why such an approach may be difficult to introduce into the green life industry to control the use of high risk plants. The first is the sheer number of plants that would need to be labelled in any single nursery or landscaping firm. The second is that it is difficult to imagine a nursery or landscaping firm labelling a plant they are trying to sell or use as 'high risk' because it would contradict their efforts elsewhere. It might be possible to conceive of particular plants that could be labelled as 'champion', 'alternative' or 'environmentally-safe' and this might be explored further by the steering committee of the scheme, for example in a staged sequence. Any branding of plants

through the Scheme, must use caution around branding plants with the word 'safe', for implied health connotations. However due to the logistics of labelling individual plants, we have recommended that branding be of participating green life organisations (not individual plants).

RECOMMENDATION 7

That all green life industry organisations that become certified with the Plant Sure Scheme and conform to the scheme are able to display the scheme's brand/logo on their organisational signage, website and other promotional platforms.

[Design Parameter #1]

PARTICIPATION (STAKEHOLDER INVOLVEMENT)

According to the Nursery and Garden Industry Association, the nursery industry has close to 20,000 small to medium sized businesses, 60,000 employees in metropolitan and regional Australia and annual retail sales of $5.5 billion (http://www.growmeinstead.com.au/public/NGIA-Invasive-Weeds-Policy.pdf). Two reports by IBISWorld published in 2017 provide different analyses of the nursery industry. The 'Nursery Production in Australia: Market Research Report' suggests an annual income for the nursery production industry of $726 million, employment of 3,098 people and 1,147 business (https://www.ibisworld.com.au/industry-trends/market-research-reports/agriculture-forestry-fishing/agriculture/nursery-production.html). The 'Garden supplies retailing in Australia: Market Research Report' suggests an annual income for the garden supplies retailing industry of $2 billion pa, employment of 11,000 people and 2,420 businesses (https://www.ibisworld.com.au/industry-trends/market-research-reports/retail-trade/other-store-based-retailing/garden-supplies-retailing.html). The difference in these market breakdowns underscores the need for comprehensive stakeholder mapping as part of the Plant Sure project.

A key factor in the success of voluntary environment programs is participation of the full suite of relevant stakeholders (see Literature Review). There are many ways that this can be achieved. Reed *et al.* (2009)[1] have reviewed the different methods of stakeholder analysis and provide a helpful typology of the different methods.

On the basis of reviewing other schemes, we recommend that stakeholder mapping is desirable in Phase 2 of the Scheme to help inform key decisions such as providing a definitive source of information on how many businesses are involved in the green life industry, what kind of income generation they have, how interested they might be in becoming involved in a voluntary scheme, what their willingness to pay is, and this information will directly influence the model components.

[1] For full citation, see reference list in Literature Review.

The stakeholder analysis of the green life industry should therefore include an understanding of the market segmentation (the range and diversity of stakeholders, both horizontal and vertical), the market share of different stakeholders and their willingness to pay for the costs of the Scheme, the geographic spread and reach of different stakeholders, and an investigation of volunteer environmental programs that may be of relevance to the Scheme and (most importantly) if they can provide or identify potential volunteers to assist in the monitoring of the success of the scheme.

Table 13: Different ways of involving stakeholders.

Method	Example	Notes
1. Steering committee	PlantRight	Whilst most schemes examined had stakeholder representation on a Board (usually fairly narrow stakeholder involvement), PlantRight had the model of an expanded steering committee with 20 stakeholders representing industry, the research community, environment groups and government
2. Technical committee	PlantRight Smart WaterMark Certified Organic ISO14001	Having a strong technical committee with specified roles enabled broad stakeholder involvement
3. Staff	PlantRight Smart WaterMark Certified Organic EnviroDevelopment Heart Foundation NIASA ISO14001	Most of the schemes we reviewed employed staff who provided a range of roles (depending on the scheme) which included: education and extension and stakeholder networking (e.g. PlantRight); certifying or approving applications (e.g. Certified Organic); writing standards; monitoring compliance of participating organisations (e.g. Certified Organic); administering the scheme; coordinating the monitoring of the overall scheme (e.g. PlantRight)
4. Industry stakeholders	All schemes	The success of any scheme will be directly related to the degree of buy-in of industry stakeholders. All schemes put significant resources into recruiting industry stakeholders and maintaining their involvement. Some schemes allow certified industry stakeholders to become members with voting rights in decision-making forums of the scheme. Some schemes put significant resources into education and outreach with their industry stakeholders. In terms of the nursery industry, the plant breeding and supply sectors will be as important as the retail sector.
5. Members	Forestry Stewardship Certification ISO14001 Smart WaterMark EnviroDevelopment Certified Organic	The involvement of members is treated quite differently by the different schemes and depends in part on the governance structure of the organisation. Members usually acquire special rights (such as voting in decision-making fora), high level education or advice, etc. Where there is a membership base, resources have to be devoted to servicing that membership and maintaining their involvement
6. Allies	PlantRight	PlantRight has a special category of stakeholder involvement — that of 'allies'. These are people or organisations that support PlantRight, including sharing educational materials and awareness of PlantRight, being a part of our Steering Committee and Plant List Committee, and volunteering in the annual nursery survey
7. Sponsors and supporters	Smart WaterMark	Some schemes have sponsors or organisations that provide general support
8. Volunteers	PlantRight	The only scheme that involved volunteers was PlantRight. Every spring, some 170 volunteers conduct a survey of plant retailers across California to gather information about the retail market for invasive

		plants. A key source of volunteers is from the Master Gardeners scheme. Volunteers from the Masters Gardeners scheme underpin the success of this scheme and are the key source of volunteers. A similar scheme does not operate in Australia and another source of volunteers would need to be identified. One possible source is the garden club network.

The schemes examined as part of this review use different methods to involve stakeholders (see Table 13)

None of the schemes that we reviewed specifically mentioned that they had conducted stakeholder mapping. However at the commencement of the Plant Sure Scheme a stakeholder mapping exercise will be essential to identify the key stakeholders and the desired ways to involve them, especially given the stated desired aim for the scheme to be National ready. Of the methods described in Table 13 we would rank the methods as follows:

- Highly desirable: steering committee and technical committee with a full range of stakeholders, staff, industry stakeholders;
- Desirable: volunteers, sponsors;
- To consider: members, allies, supporters

RECOMMENDATION 8

That the Plant Sure Scheme undertakes a process of stakeholder mapping as part of the Phase 2 of the Scheme to identify the range of stakeholders that could be involved in the scheme and the desired methods to involve them. Highly desirable methods of participation are: steering committee and technical committee (with a full range of stakeholders), staff and industry stakeholders. Desirable methods are volunteers and sponsors. Other methods to consider are members, allies and supporters. If volunteers are involved in the scheme (for example in monitoring) a source of volunteers would need to be identified.

[Design Parameters #3, #4, #7, #9, #22]

MONITORING, EVALUATION AND COMPLIANCE

There are two components to the monitoring and evaluation of the Plant Sure Scheme. The first will be the monitoring of individual Green life companies or organisations to ensure that they comply with the standards imposed by the scheme. The second is to evaluate the success of the overall Scheme.

The schemes examined have two basic approaches. One is where individual participants are assessed or reviewed. With Smart WaterMark, participants are reviewed when they reapply for renewed certification. With Certified Organic, farms are inspected annually.

The best system we found in reviewing the different schemes was that employed by the PlantRight scheme. They carry out an annual survey using volunteers. Every spring, some 170 volunteers conduct a survey of plant retailers across California to gather information about the retail market for invasive plants. The annual survey fulfils three functions:

1. It enables PlantRight to determine which invasive plants can be found for sale in retail markets and where they are being sold;
2. It provides a measure of how effective the scheme is in reducing the sale of invasive species; and
3. It identifies particular nurseries or nursery chains that are not complying with the standards that they agreed to follow.

The question needs to be asked: 'Is such an approach realistic here?' The PlantRight scheme relies heavily on the Master Gardeners scheme. Such a scheme does not exist in Australia. Whilst there are volunteer garden clubs, it is uncertain that they would contribute sufficient volunteers to monitor nurseries. Without a good source of volunteers and constrained resources other alternatives would need to be explored such as biannual monitoring, random monitoring, a sample monitored each year or all nurseries surveyed over a (say) five-year period. In the absence of volunteers, monitoring could be conducted by the staff of the Scheme or specially accredited consultants. If the steering committee decides that the Scheme should be broader than just nurseries and encompass other parts of the supply chain (see Recommendation #1), it will be much harder to monitor, particularly with volunteers.

Recommendation #9 advocates a similar monitoring and evaluating approach of the PlantRight Scheme — that of an annual nursery survey. It might be argued that if the Scheme ends up encompassing other parts of the supply chain (see Recommendation #1) a survey of just the nurseries will be too narrow. However the monitoring of every element of the supply chain will be expensive and much harder to organise. Keeping the monitoring to just the nurseries will be much easier to organise and will give a good indication of how successful the Scheme is, as it could be assumed to a large degree that if the plants are not being sold by the nurseries, then they probably are not being used throughout the supply chain.

RECOMMENDATION 9

That the Plant Sure Scheme adopts a similar monitoring and evaluating approach of the PlantRight Scheme: that of a survey of firms and entities that have joined the scheme. This survey would have the functions of determining which invasive (high risk) species are being sold in retail markets, determining the effectiveness

of the Scheme and identifying any nurseries or certified industry members that are not complying with the standards of the Scheme. The monitoring could be conducted either by volunteers, staff or accredited consultants, depending on resources.

[Design Parameters #12, #18, #24]

SCHEME DESIGN

Most of the schemes we reviewed were designed as a particular organisation to register a particular product as complying with a particular standard — whether it be a farm wanting to indicate it was selling only organic produce (Certified Organic), a water product wanting to indicate it conserved water (Smart WaterMark), a forest producer who wanted to show they were managing their forest sustainably (Forestry Stewardship Certification) or a nursery showing that its business practices were sound (Nursery Industry Accreditation Scheme). They all went through some kind of steps or checks to demonstrate that they were following some kind of standard. The key to the Plant Sure Scheme will be to have the following components:

1. A known standard or charter to which green life industries can aspire (this will be articulated by the lists — see Recommendation #3.
2. Educational and outreach program to educate green life organisations of the problems associated with the selling or using of invasive (high risk) species, and the alternative plants that can be used instead.
3. A training program for green life organisations to undertake (as occurs with the PlantRight scheme) which enables organisations to demonstrate they understand the key issues surrounding sale of invasive (high risk) plants.
4. A document that a green life organisation signs that spells out their obligations in signing up as a Plant Sure organisation.
5. A brand or logo that a Plant Sure green life organisation can display on their promotional platforms — see Recommendation #6.
6. A monitoring and evaluation system that enables Plant Sure to identify non-complying green life organisations and to evaluate the success of the program — see Recommendation #8.
7. A Charter or Standards document that spells out the approach of Plant Sure in removing invasive (high risk) plants from sale and use.
8. A fee structure based on a Business Planning process that ensures that the Scheme is self-supporting and inclusive of relevant businesses regardless of size, type, industry sector or location.
9. A technical panel or panels encompassing independent expertise that identifies the plants that should not be sold/used, alternative plants, those that should be watched, and those that have been successfully eliminated from sale — see Recommendation # 3.

With these components the scheme should be transferrable to other jurisdictions and other industry sectors.

It is also important that the Plant Sure Scheme does not duplicate other programs. The Department of Primary Industries, local government, local weed authorities, quarantine authorities and Local Land Services currently do weed assessments and risk analyses and liaise with nurseries to remove particular plants from sale. It will be essential that the Plant Sure Scheme complements such regulatory activities and not attempt to duplicate them. This aspect is covered in Recommendation #5: '…The business plan should identify opportunities for seed funding and collaboration with similar programs and projects to share knowledge and resources, identify synergies and opportunities and avoid duplication …'

RECOMMENDATION 10

That the Plant Sure Scheme adopts the following components:

1. An educational and outreach program to educate green life industries of the problems associated with the selling of invasive (high risk) species, and the alternative plants that can be used instead.
2. A training program for green life organisations to undertake which enables them to demonstrate they understand the key issues surrounding sale of invasive (high risk) plants.
3. A document that a green life organisation signs that spells out its obligations in signing up as a Plant Sure organisation.
4. Sensitive recognition and acknowledgement of participating green life organisations, e.g. by allowing them to display the Scheme's brand and logo on their promotional platforms.
5. A monitoring and evaluation system that enables Plant Sure to identify non-complying green life organisations and to evaluate the success of the program.
6. A Charter or Standards document that spells out the approach of Plant Sure in removing invasive (high risk) plants from sale and use.
7. A fee structure based on a Business Planning process that ensures that the Scheme is self-supporting and inclusive of relevant businesses regardless of size, type, industry sector or location.
8. A technical panel or panels encompassing independent expertise that identifies the plants that should not be sold, alternative plants, those that should be watched, and those that have been successfully eliminated from sale.

[Design Parameters #15, #16, #21]

APPENDIX I

Table 14: List of design parameters for scheme checked against this report's recommendations.

Design Parameters	Recomm. No.
1. Has a brand that is easily identifiable and inspires consumer confidence	**6**
2. Provides equitable access to relevant businesses, regardless of size, type, industry sector, or location, to participate in the Scheme	**4**
3. Involves stakeholder mapping to demonstrate understanding of the industry sectors	**7**
4. Is non-exclusive and open to all industry sectors	**2, 7**
5. Includes a standardised, simple and easy approach to industry and consumer stakeholders	**5**
6. Is transparent, independent, and robust, and uses best-practice and appropriate governance	**2, 3**
7. Appeals to industry stakeholders and is sustainable for them, both environmentally and economically	**2, 7**
8. Is independent and self-sustaining, such that it "takes on a life of its own" and is run 'outside' of industry, but for industry	**2, 4**
9. Enables broad stakeholder engagement and consultation with a view to broad industry uptake, commitment and ownership of the Scheme	**2, 3, 7**
10. Encompasses independent expertise to develop appropriate Standards, audit and compliance processes, and education elements	**3**
11. Is based on the agreed decision support tool that is dynamic and will allow plants to be reassessed as needed to determine weed risk	**3**
12. Allows a transitional approach to removing 'high risk' species from trade over a 12-18 month period (or as determined appropriate via consultation)	**8**
13. Utilises an agreed categorisation and prioritisation of 'high risk' plants for removal from trade	**3**
14. Allows for collaboration with similar programs and projects to share knowledge and resources, identify synergies and opportunities and avoid duplication	**4**
15. Contains robust consumer and industry education and awareness methodologies to promote the Scheme and its objectives	**9**
16. Is able to be adapted or expanded to a cross-jurisdictional/National level, and for other industry sectors following completion of this project	**9**
17. Includes the development of a business plan or management model to ensure ongoing Scheme viability plus future proofing of Scheme ownership and branding	**4**
18. Includes transparent and appropriate audit and compliance processes	**5, 8**
19. Includes options for an 'institutional home' for the Scheme over the long term	**1**
20. Includes mechanism for conflict resolution for industry, community and government	**3**
21. Ensures focus on positive environmental and economic outcomes, as well as social and behavioural change regarding use of weedy species, and be inclusive of a range of triple bottom line considerations such as: a. economic, including impacts to green-life industries (and impacts on other primary industries); b. environmental, including to non- and threatened biodiversity; and c. societal, including human and animal health, community, cultural, infrastructure, tourism and other considerations	**9**
22. Participation (recruitment and maintenance of membership)	**7**
23. Standards that signal the intent of the organisation and the required practices of participants	**3**
24. Monitoring standards and whether the group is meeting its aims, as well as monitoring its members to ensure freeriding is not occurring	**8**

Table 15: Key decisions to make in the design of the Plant Sure Scheme by the Steering Committee.*

Decision questions	Options	Yes	No	Maybe
1. Scheme scope	(a) Orientate the Scheme solely at the producers/suppliers of plants	1	12	1
	(b) Orientate the Scheme at all key parts of the supply chain of the green life industry	11	4	
	(c) Commence the Scheme orientated at just at producers and suppliers of plants and then later encompass other parts of the supply chain as well	13	5	1
2. Scheme components	a) An educational and outreach program to educate green life organisations of the problems associated with the selling of invasive (high risk) species, and the alternative plants that can be used instead.	21		1
	b) A training program for green life organisations to undertake which enables them to demonstrate they understand the key issues surrounding sale of invasive (high risk) plants	17		3
	c) A document that a green life organisation signs that spells out its obligations in signing up as a Plant Sure organisation.	19		2
	d) Sensitive recognition and acknowledgement of participating green life industries, e.g. by allowing them to display the Scheme's brand and logo on their promotional platforms	21		
	e) A monitoring and evaluation system that enables Plant Sure to identify non-complying green life organisations and to evaluate the success of the program	21		
	f) A Charter or Standards document that spells out the approach of Plant Sure in removing invasive (high risk) plants from sale.	18		2
	g) A fee structure based on a Business Planning process that ensures that the Scheme is self-supporting and inclusive of relevant businesses regardless of size, type, industry sector or location.	18	1	1
	h) A technical panel or panels encompassing independent expertise that identifies the plants that should not be sold, those that should be watched, and those that have been successfully eliminated from sale.	18		2
3. Governing body	a) Steering committee with multiple stakeholders	10	6	3
	b) Board of directors	13	3	2
	c) Other option	1		
4. Technical involvement	a) Two separate technical panels with the following responsibilities: • review potential invasiveness of particular species; • generating lists of species considered invasive (high risk), species that should be treated with caution, and those species which have been successfully eliminated from sale • generate a set of standards for the nursery industry to follow with regards to the sale of potentially invasive (high risk) species	12	3	3
	b) Single technical panel to fulfil these roles	2	8	3

	c) Single technical panel plus staff to fulfil these roles	8	4	2
	d) Staff in conjunction with Board to fulfil these roles	2	8	1
	e) Independent certifying body to fulfil these roles	5	4	2
5. Plant lists	The scheme is based on the development of a list of horticultural plants that is considers invasive (high risk) and not desirable to grow along with companion lists of plants that can be grown instead of the invasive (high risk) species, plants that should be treated with caution, and species that have been successfully eliminated from sale	19		1
	The scheme is not based on the development of lists but on a risk-based assessment whereby individual companies and/or customers do a risk assessment of species using the decision-making tool	2	13	2
6. Institutional home	a) Within an existing NGO	3	8	4
	b) Within an industry organisation (e.g. NGIA or NGINA)	6	10	1
	c) Form an independent organisation	11	2	4
7. Funding	a) Make the scheme independent through a fee structure	16		1
	b) Fund the scheme by accessing the nursery industry levy	8	6	3
	c) Fund the scheme through government grants	5	8	2
8. Green life industry certification	a) Assessment of applications from green life organisations to join the scheme is done by staff of the Scheme	11	2	1
	b) Assessment of applications from green life organisations to join the scheme is done by a technical panel of experts	10	6	2
	c) Potential participants self-assess following training	5	6	3
9. Monitoring of success of scheme	a) by volunteers	7	5	3
	b) by staff	8	4	1
	c) by the Board	5	8	3
	d) by an accredited consultant	10	2	2
	e) other, e.g. Landcare/Bushcare volunteers, local govt	4	4	4
10. Participation	a) steering committee/Board	12	2	
	b) technical committee/s	15	1	
	c) staff	11		2
	d) industry stakeholders	14	2	
	e) volunteers	9	1	3
	f) sponsors	7	5	
	g) members	10	2	1
	h) allies/ supporters	10	2	
11. Branding	(a) All green life organisations that become certified as complying with the Plant Sure Scheme are able to display the scheme's brand/logo on their organisational signage, website and other promotional platforms.	18		
	(b) Individual plants are branded as 'safe'	12	6	1

* Results from workshop held on 23 February 2018. Twenty-two participants answered the survey. Not every question was answered by every participant. Green shading indicates strong consensus. Orange shading indicates lack of consensus and more discussion will be necessary. The main areas where there was not consensus were the type of governing body, the institutional home, the method of certification and who should monitor the scheme.